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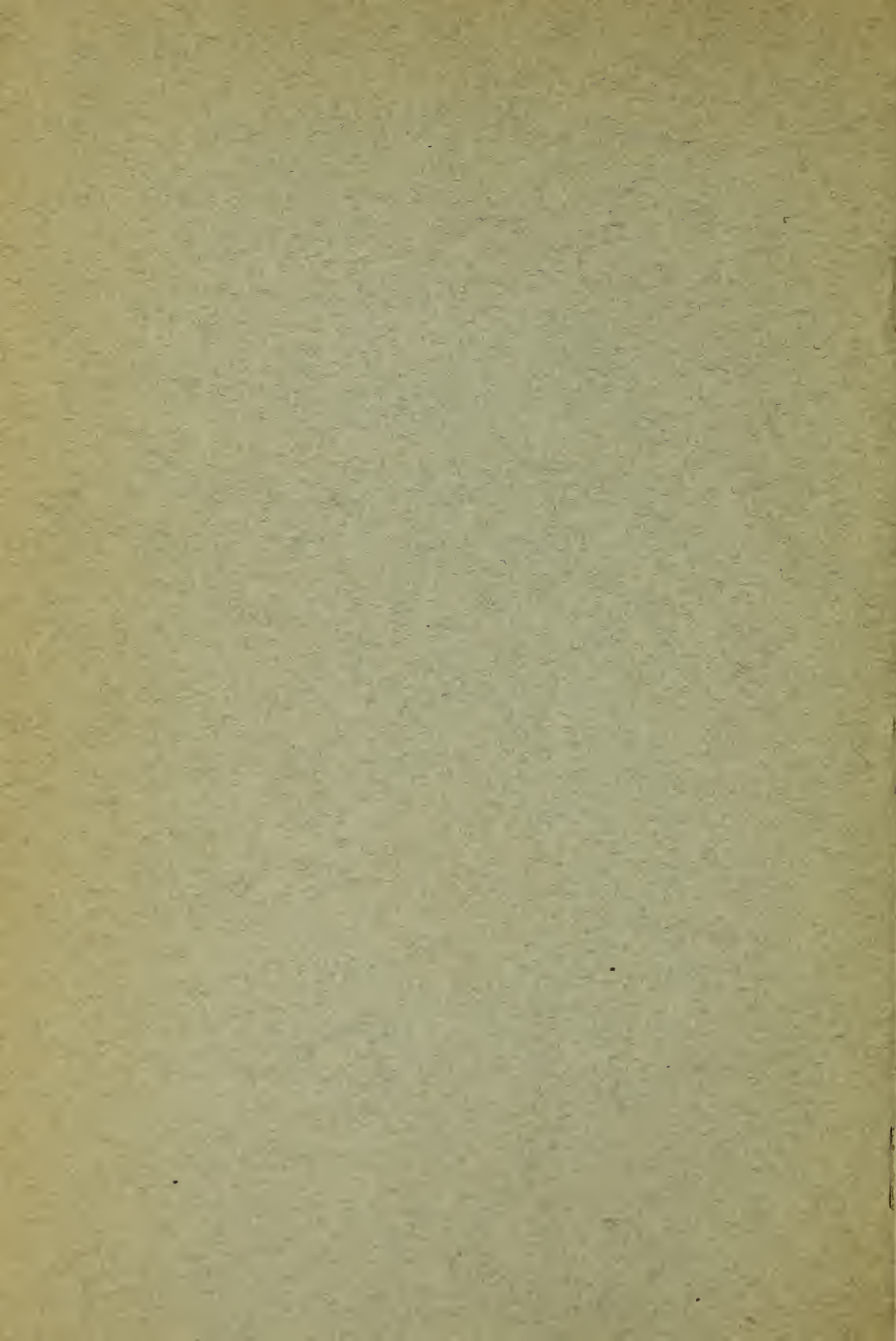
June 5, 1922

No. 11

SCHOOL OF EDUCATION
1922-1923



PITTSBURGH, PENNSYLVANIA
PUBLISHED BY THE UNIVERSITY



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SCHOOL OF EDUCATION 1922-1923

Including Courses in the College and the School of Economics
open to School of Education Students.



PITTSBURGH, PENNSYLVANIA

The University of Pittsburgh Bulletin is published by the University of Pittsburgh and is issued tri-monthly. Entered March 13, 1914, at the Post Office at Pittsburgh, Pa., as second-class matter under Act of Congress of August 24, 1912.

BOARD OF TRUSTEES OF THE UNIVERSITY OF PITTSBURGH **1922-23**

The Governor of the Commonwealth of Pennsylvania—(*Honorary*)
The Mayor of the City of Pittsburgh.
The Chancellor of the University.

Class I. Term expires June, 1924

Elected

1893	Andrew William Mellon	Pittsburgh
1900	James Henry Lockhart	Pittsburgh
1903	Thomas Harlan Baird McKnight	Pittsburgh
1903	Thomas Patterson	Pittsburgh
1911	John Knox McClurkin	Pittsburgh
1912	John Crawford Wallace	New Castle
1913	Alfred Reed Hamilton	Pittsburgh
1917	William Lewis Clause	Pittsburgh
1917	Benjamin Gilbert Follansbee	Pittsburgh
1919	Ogden Mathias Edwards, Jr.	Pittsburgh

Class II. Term expires June, 1925

1890	Benjamin Thaw	Pittsburgh
1904	William Lucien Scaife	Pittsburgh
1907	Joseph Clifton Trees	Pittsburgh
1908	Walther Riddle	Pittsburgh
1914	George Sturgis Oliver	Pittsburgh
1916	Richard Beatty Mellon	Pittsburgh
1918	George Breed Gordon	Pittsburgh
1920	Charles Wesley Ridinger	Pittsburgh
1920	Isaac William Frank	Pittsburgh
1909	Edward Vose Babcock	Pittsburgh

CLASS III. Term expires June, 1923

1882	Rt. Rev. Cortlandt Whitehead	Pittsburgh
1889	William Jacob Holland	Pittsburgh
1902	George Hubbard Clapp	Pittsburgh
1906	Howard Heinz	Pittsburgh
1907	Andrew Jackson Kelly	Pittsburgh
1907	Samuel Alfred Taylor	Pittsburgh
1914	Henry Clay McEldowney	Pittsburgh
1920	David Aiken Reed	Pittsburgh
1920	William Penn Snyder, Jr.	Pittsburgh
1920	Homer David Williams	Pittsburgh

CALENDAR

1922

June 19-24; Mon.—Sat	College Entrance Board Examinations
July 5—Wed	Summer Session Registration
July 5—Aug. 15	Summer Session
Aug. 15—Tues.	Summer Convocation
Aug. 29-30; Tues.—Wed.	Entrance Examinations
Sept. 18—Mon.	Re-examination (Second Semester
	1921-22)
Sept. 20-23; Wed.—Sat.	First Semester Registration
Sept. 25—Mon.	First Semester begins
Oct. 11—Wed.	Fall Convocation
Nov. 11—Sat.	Armistice Day—Holiday
Nov. 30—Dec. 2; Thursday.—Sat.	Thanksgiving Recess
Dec. 18—Mon.	Christmas Recess begins

1923

Jan. 2—Tues.	Classes resume
Jan. 27—Feb. 2; Sat.—Fri.	First Semester Examinations
Feb. 3—Sat.	First Semester ends
Feb. 1-3; Thursday.—Sat.	Entrance Examinations
Feb. 8-10; Thurs.—Sat.	Second Semester Registration
Feb. 12—Mon.	Second Semester classes begin
Feb. 19—Mon.	Charter Day
Feb. 22—Thurs.	Washington's Birthday—Holiday
Feb. 24—Sat.	Re-Examinations (First Semester)
Mar. 26-31; Mon.—Sat.	Easter Recess
Apr. 2—Mon.	Classes resume
May 30—Wed.	Decoration Day—Holiday
June 4-9; Mon.—Sat.	Second Semester Examinations
June 9—Sat.	Second Semester ends.
June 10—Sun.	Baccalaureate Service
June 13—Wed.	Commencement
Aug. 15—Tues.	Summer Convocation
May 28—Mon.	Hydraulics Camp
June 9—Sat.	End of Hydraulics Camp
June 11—Mon.	Surveying Camp
June 18—Mon.	Beginning of Summer Term

FACULTY

JOHN GABBERT BOWMAN, LL.D.,	<i>Chancellor of the University</i>
GEORGE HARVE REAVIS, PH.D.	<i>Dean of the School of Education</i>
SAMUEL B. LINHART, D.D.	<i>Secretary of the University</i>
JOHN GILBERT QUICK, B. S.	<i>University Registrar</i>
JAMES STEELE GOW, A.B.	<i>Assistant to the Chancellor</i>
JOHN COLVIN FETTERMANN, PH.M.	<i>Dean of Men and University Examiner</i>
THYRSA WALTHEOW AMOS, A.M.	<i>Dean of Women</i>
CHARLES W. HUNT, PH.D.	<i>Extramural Instruction</i>
Director of Extramural Instruction	
H. B. SMITH, PH D.	<i>Vocational Education</i>
Professor of Vocational Education and Director of the Department of Vocational Teacher Training.	
CHESTER ARTHUR BUCKNER, PH.D.	<i>Secondary Education</i>
Professor of Secondary Education.	
ALICE MARY CARMALT, A.M.	<i>Elementary Education</i>
Assistant Professor of Elementary Education.	
STURGISS BROWN DAVIS, PH.D.	<i>Educational Administration</i>
Professor of Educational Administration.	
KATHARINE FOULKE, A.M.	<i>Secondary Education</i>
Assistant Professor of Secondary Education.	
ADA VAN STONE HARRIS	<i>Elementary Education</i>
Lecturer in Elementary Education.	
ALFRED PROCTER JAMES, A.M.	<i>Special Methods</i>
Assistant Professor of History.	
WILLIAM FRANKLIN KENNEDY, A.M.	<i>History and Principles of Education</i>
Assistant Professor of History and Principles of Education.	
CLYDE B. MOORE, A.M.	<i>History and Principles of Education</i>
Assistant Professor of History and Principles of Education.	
JOHN FREDERICK LOUIS RASCHEN, LITT.D.	<i>Special Methods</i>
Professor of Modern Languages.	
EVAN T. SAGE, PH.D.	<i>Special Methods</i>
Professor of Latin	
MARION SHEPARD, M.D.	<i>Health Education</i>
Associate Professor of Physical Education and Medical Adviser for Women.	
GILBERT GRIMES WEAVER, B.S.	<i>Vocational Education</i>
Professor of Vocational Education.	
W. PAUL WEBBER, PH.D.	<i>Special Methods</i>
Professor of Mathematics.	
JONOTHAN LEO ZERBE, A.M.	<i>Special Methods</i>
Assistant Professor of English.	

GENERAL INFORMATION

HISTORY OF THE UNIVERSITY

The University of Pittsburgh was granted a charter by the Commonwealth of Pennsylvania as Pittsburgh Academy in 1787. In 1819 a second charter was granted creating the Western University of Pennsylvania as the legal successor of the Pittsburgh Academy. In 1908 its name was changed to the University of Pittsburgh. Thus the University has a continuous history of one hundred and thirty five years.

Since its removal in 1908 to the present location in Oakland, the great educational and civic center of Pittsburgh, the attendance has increased from 1,240 to 6,500 students.

The University of Pittsburgh was founded by the State to provide higher education in Western Pennsylvania. Throughout its history the University has been partially supported by the State.

The Alumni of the University, many of whom are among the leading citizens of Pennsylvania, have rendered efficient service in every department of the varied life and interests of the State.

Sound scholarship and an atmosphere which promotes the spiritual life of students and Faculty have always been characteristic of the University.

At the present time the University includes the following Schools, named in the order of their founding: The College, Astronomy, (Allegheny Observatory) Engineering, Law, Medicine, Pharmacy, Dentistry, Mines, Education, Economics, also the Graduate School and the Mellon Institute.

The Evening School of Economics, Accounts and Finance and Saturday and Evening Classes offer courses to those who are unable to attend the regular classes.

A more complete history of the University will be found in the General Catalog.

THE SCHOOL OF EDUCATION

Courses in education were first offered in the University of Pittsburgh in the year 1904-05 in a newly established department of psychology and education. Saturday classes for teachers in service soon followed and evening courses of the same character were next offered. The growth of the enrollment in these courses indicated a real and increasing demand for systematic training for teaching, and on February 3d, 1910, the Board of Trustees established The School of Education to serve as a professional school of collegiate rank.

The School of Education offered its first courses in the Summer Session of 1910, and enrolled its first regular under-graduates in September of that year. Eight seniors, four juniors and seventy-one unclassified students were registered the first year, including the evening and Saturday classes. The faculty included the dean, one professor and two part-time instructors. In a short time the School became one of the largest University Schools of Education in the country.

LOCATION

The offices of the School of Education are located in State Hall, which may be reached by street cars via Fifth Ave or Forbes Street; the nearest stop is Bigelow Boulevard.

The present site of the University, purchased in December, 1907, is sixty-eight acres in extent and forms a part of the historic Schenley Farms in Oakland. It is one block from the Schenley Hotel. The Memorial Hall, the Armory, and the Twentieth Century Club face the campus of the University. Only a few yards away are the buildings of the University Club, Athletic Club, the new Masonic Temple and Syria Mosque. Three blocks distant is the Carnegie Institute with its Museum, its Library, its Art, and its Music, and the Phipps Conservatory. Other public buildings are gathering around the same spot. The University is in the center of the institutional and educational life of the city.

ENTRANCE REQUIREMENTS

The regular course in the School of Education is four years in length. The work of the first two years is pursued in The College and, after the successful completion of the prescribed courses, the student's registration is transferred to the School of Education, at the beginning of the Junior year.

An applicant for admission to the School of Education as a candidate for the degree of Bachelor of Arts must satisfy the requirements of admission to the University and present sixty credits from the work offered to freshmen and sophomores in the College of this University, or the equivalent of such credits.

An applicant for admission to the School of Education as a candidate for the degree of Bachelor of Science must satisfy the requirements of the University for admission and present sixty semester hours, or their equivalent, of approved work beyond the secondary school.

In certain cases, students who have attained the age of twenty-one, and whose experience and general training warrant it, are admitted to the School of Education as "Special" students without credentials. Such students are not candidates for a degree at the time of admission, and the credits earned are not degree-credits until such time as the entrance requirements have been satisfied,

During the freshman and sophomore years the student should take the studies outlined in one of the following four groups:

GROUP I

Language and Literature

Freshman Year		Sophomore Year*	
English	8	English	6
Foreign Language	6	Foreign Language	6
Mathematics or Laboratory		Major	6
Science	6 or 8	Elective	12 or 14
Elective (Foreign Language		Physical Education	0
preferred)	6		—
Elective	4	Total	30 or 32
Physical Education	0		
	—		
Total	30 or 32		

GROUP II

Social Science

Freshman Year		Sophomore Year	
English	8	English	6
Foreign Language	6	Foreign Language	6
Mathematics or Laboratory		Major	6
Science	6	Elective	12
Elective (History preferred)..	6	Physical Education	0
Elective	4		—
Physical Education	0	Total	30
	—		
Total	30		

*Not more than 6 credits per semester in any one department.

GROUP III

Biological Science

Freshman Year		Sophomore Year*	
English	8	English	6
Foreign Language or		Foreign Language	6
Science	6	Elective	4
Chemistry	8	Physics	8
Biology	8	Psychology, Biology or	
Physical Education	0	Chemistry	6
	—	Physical Education	0
Total	30		—
		Total	30

GROUP IV
Physical Science

Freshman Year		Sophomore Year	
English	8	English	6
Mathematics	8	Modern Language or Social Science	6
Chemistry	8	Mathematics	8
Physics	8	Physics or Chemistry	8
Physical Education	0	Elective	2
	—	Physical Education	0
Total	32		—
		Total	30

In the sophomore year the student should complete six credits in Psychology. In the junior and senior years the student continues in the academic subjects and completes, in addition, eighteen semester hours of professional work.

To be admitted to any one of the four groups in The College, it is necessary that the applicant be a graduate of a First Grade Secondary School, and that the credentials show distribution of High School units that satisfies one of the following outlines:

GROUP I.—*Language & Literature*

	UNITS
English	3
Mathematics	1
History	1
Foreign Language (One Lan- guage)	2
Electives	8
Total	15

GROUP II.—*Social Science*

	UNITS
English	3
Mathematics	1
History or Civics	1
Electives (2 units Modern Language advised)	10
Total	15

GROUP III.—*Biological Science*

	UNITS
English	3
History	1
†Mathematics	2
Foreign Language (One Lan- guage)	2
Electives	7
Total	15

§GROUP IV.—*Physical Science*

	UNITS
English	3
Mathematics	3
History	1
Foreign Language (One Lan- guage)	2
Electives	6
Total	15

*A unit is allowed for the satisfactory completion of one year's work in a given subject. The required length of the school year is 36 weeks. Not less than one-half unit is accepted in any subject.

†Students entering Group III should elect additional units in High School Mathematics.

§Students planning to enter Group IV are advised to take four years of High School Mathematics and one year each of Physics and Chemistry.

CURRICULA AND DEGREES

The curricula of the School of Education are definitely planned to serve groups of students who have varying interests. The undergraduate curricula place chief emphasis on the academic subjects to insure effective teaching. By careful planning of the major, minor, and elective subjects the aims of individual students can be adequately realized. The undergraduate curricula lead to the degrees of Bachelor of Arts (A.B.) and Bachelor of Science (B.S.).

The graduate curricula lead to the degrees of Master of Arts (M.A.), Master of Science (M.S.), and Doctor of Philosophy (Ph.D.). Graduate courses are under the control of the Graduate Council of the University.

MAJOR AND MINOR SUBJECTS

By the close of his freshman year the student should select a major subject in line with his academic interest. The selection of a minor subject should be deferred until the beginning of the junior year, when the selection should be made in consultation with his adviser. The major and minor subjects should be either those which the student expects to teach or those which represent the field in which he expects to work. Not more than twelve of the required credits in foreign language may be applied on a major or minor. In meeting the requirements for a degree not more than forty credits in the field of any one subject may be offered.

Most beginning high school teachers find it necessary to teach two subjects and some are called upon to teach three subjects. For this reason every candidate for the high school teaching service should have thorough training in one subject and reasonable preparation in two other subjects. Under the regulations governing teachers' certificates in Pennsylvania a high school teacher must have at least twelve semester hours college training in each subject he is authorized to teach.

It is very important that prospective high school teachers select a combination of subjects that is in demand. For example, a teacher of Science is often called upon to take a class in Mathematics, but rarely a class in Latin; while a teacher of Modern Languages is rarely called upon to teach a class in Science, but is frequently assigned a class in Latin.

Experience has shown that the three most usual combinations are:—English and History; Mathematics and Science; Latin and Modern Languages. There are many possible teaching combinations and no attempt is made here to list them, but each student is requested to consult his adviser in regard to a selection of minors that will form a useful teaching combination with his major subject.

Students specializing in History should select a balanced program rather than devoting a major portion of their time to any one period. One teacher is also frequently required to teach all the high school sciences. Public speaking is desirable as a part of the preparation for teaching English. Students preparing for the position of high school English teacher should not neglect English composition in making their selections of English courses.

SUMMARY OF REQUIREMENTS FOR DEGREES

A. For the degree of Bachelor of Arts

1. Major subject 24 credits
2. Minor subject 12 credits
Acceptable major and minor subjects are those usually taught in secondary schools.
3. Distribution fields 30 credits
Ten credits in each of the following groups in addition to the work for the major subject.
 - a. English and Public Speaking, Foreign Languages
 - b. History, Economics, Political Science, Social Science
 - c. Physical Science, Biological Science, Mathematics.
4. Professional work in education 18 credits
5. Electives to make a total of 120 credits

In meeting the requirements for the degree of Bachelor of Arts not more than twenty-four credits may be offered in the field of education, and not more than forty credits in the field of any other subject. Four units of language credits earned in high school or an equivalent amount in College, or in both, are required for the degree of Bachelor of Arts. Six credits of college work are counted as the equivalent of one unit of high school work. Education may not be counted as a major or minor for this degree.

B. For the degree of Bachelor of Science

1. Major subject 24 credits
2. Minor subject 12 credits
Acceptable major and minor subjects are those usually taught in secondary schools. On the approval of the Dean, candidates with teaching experience may select Education as a major for the Bachelor of Science degree. At least two units of modern language credits earned in high school or an equivalent amount in college, or in both, are required for the degree of Bachelor of Science. Six credits of college work are counted as the equivalent of one unit of high school work.
3. Distribution fields 30 credits
Ten credits in each of the following groups in addition to the work for the major subject.
 - a. English, Public Speaking, Foreign Languages
 - b. History, Economics, Political Science, Social Science
 - c. Physical Science, Biological Science, Mathematics.

4. Professional work in Education 18 credits
5. Electives to make a total of120 credits
 substitute elective work in educational theory for the observation and
 practice teaching of the senior year.

CERTIFICATION OF TEACHERS

The Pennsylvania State Department of Public Instruction has issued the following regulations governing high school teachers certificates.

1. *Provisional College Certificate*—This certificate entitles the holder to teach for three years the subjects prescribed for a public high school of the third class or to teach in any public high school of the Commonwealth the subjects indicated on its face, and to teach in the elementary field where the applicant is the holder of a certificate for teaching in this field or has completed an approved curriculum in a school of education in preparation for teaching in such field.

The applicant for this certificate must be a graduate of an approved college or university and must have successfully completed at least eighteen semester hours of work of college grade in education distributed as follows:

Introduction to Teaching3 semester hours
 Educational Psychology3 semester hours
 Electives in Education selected from the following list ..6 semester hours

Secondary Education
 Elementary Education
 School Efficiency
 Special Methods
 School Hygiene
 Educational Administration
 Educational Measurements
 Educational Sociology
 Educational Systems
 History of Education
 Principles of Education
 Educational Psychology
 Technique of Teaching

Practice teaching in the appropriate field6 semester hours

The practice teaching requirement may be met by one hour a day of observation and practice teaching with one hour a week of conference in connection therewith for one-half year.

Three years of successful teaching experience in the field in which certification is sought together with a teaching rating of "middle" or better may be accepted as the equivalent of the practice teaching requirement.

The holder of this certificate will be certified to teach each subject in which not less than twelve semester hours have been completed.

The scope of this certificate will be extended to cover a field of learning when the distribution of the applicant's credentials so warrant.

This certificate may be renewed once on a rating of "low" or better plus six additional semester hours of work of college grade, one-half of which must be professional.

Graduates of approved colleges and universities in 1922 which have not for that year established a practice teaching course may be granted a provisional college certificate either on the basis herein prescribed or on the basis of two hundred hours of pedagogical studies as formerly prescribed. In the event of the latter basis being chosen for the issue of the provisional college certificate, twelve additional semester hours selected from the courses prescribed herein shall be satisfactorily completed before the permanent college certificate is issued.

2. *Permanent College Certificate*—The issue of this certificate is dependent upon the possession of the qualifications required for the college provisional certificate and in addition thereto three years of successful teaching experience in the appropriate field and the satisfactory completion of six semester hours of additional work of at least collegiate grade, one-half of which should be professional and the remainder related to the subjects or subject fields in which the candidate is certified to teach, together with a teaching rating of "middle" or better.

This certificate entitles the holder to teach for life the subjects prescribed for a public high school of the third class, or to teach in any public high school of the Commonwealth the subjects indicated on its face.

PRACTICE TEACHING

A plan of cooperation between the School of Education and the public schools of the community has been developed whereby students, as a part of their training, have opportunity to observe good teaching and to serve as teachers in the schools of the vicinity that can utilize their services to advantage.

The work of the student teachers is supervised by a member of the faculty of the School of Education in cooperation with those in charge of the schools where they teach. In addition to individual supervision, conferences of the student teachers are conducted weekly for the purpose of improving their teaching. As a result of this system the graduates of the School of Education should be considered as experienced teachers.

THE GRADUATE CURRICULA

The general requirement for admission to graduate study is a Bachelor's degree from an approved institution of higher learning. The completion of satisfactory undergraduate courses in psychology, methods of teaching, the social theory of education, and biology is presupposed of all candidates for an advanced degree. However, students not satisfying this requirement are permitted to enter upon graduate study on condition that they complete the prerequisite work at the first opportunity

offered. Those who are unable to qualify as graduate students may be admitted to graduate courses in education by fully satisfying the instructors in charge that they are qualified to pursue the work successfully.

Curricula leading to the degrees of Master of Arts and Doctor of Philosophy are offered in the Department of Education. These curricula are determined by the Graduate School of the University, in which the School of Education functions as a Department. The bulletin of the Graduate School should be consulted for fuller information than is given below concerning the requirements for these degrees.

CURRICULUM LEADING TO THE DEGREE OF MASTER OF ARTS

The normal quantitative requirement for the degree Master of Arts is one full year of graduate work. This includes the earning of at least twenty-four graduate credits plus the preparation of a satisfactory thesis. The student must select a major subject in the Department of Education and a minor subject either in the Department of Education or in some other department of the Graduate School. The choice of major and minor subjects is subject to approval by the dean of the School of Education. The student's thesis must be written in the field of his major subject under the supervision of the head of the corresponding department. Approximately two-thirds of the required graduate credits should be earned in the department representing the major subject and approximately one-third in the department representing the minor subject. The selection of courses in each case must be made in consultation with the head of the department concerned. The remaining graduate credits required are elective in the Department of Education. Students exempted from the completion of the prerequisite under-graduate courses on the ground of educational experience must complete graduate courses in the general history of education and in either educational psychology or principles of education. These courses so taken carry the usual graduate credit, subject to the above conditions. The candidate is required to pass a satisfactory final oral examination before the faculty on his major and minor subjects and content of his thesis.

Major and Minor Subjects.—High School teachers teaching a single academic subject and those preparing to teach a single subject should, as a rule major in that subject with a minor in education. School principals, supervisors, superintendents, and those preparing for these positions, should usually major in education. Major and minor subjects available for graduate students in the School of Education, functioning as the department of education of the Graduate School, are the history and principles of education, educational psychology, educational administration, secondary education, and elementary education. Students may also choose education as a whole as a minor subject and distribute the work of such minor subject among two or more of these fields. Graduate courses closely allied to a major or minor subject in education offered in other departments may be counted on the requirements in such major or minor subject with the consent of the head of the department representing the subject in question.

The Degree of Master of Arts.—On the satisfactory completion of this curriculum the student is recommended for the University degree of Master of Arts.

CURRICULUM LEADING TO THE DEGREE OF DOCTOR OF PHILOSOPHY

The normal quantitative requirement for the degree Doctor of Philosophy is three full years of graduate work. This includes the earning of at least sixty-four graduate credits plus the preparation of a satisfactory research thesis. The student must select a major subject in the Department of Education and two minor subjects, one of which must be outside the field of education. The choice of major and minor subjects is subject to the same approval as that of candidates for the master's degree. The student's thesis must be written in the field of his major subject under the supervision of the head of the department representing that subject. Approximately three-eighths of the required graduate credits must be earned in the department of the student's major subject and approximately one-fourth in each of the departments representing the minor subjects. The selection of courses in each case must be made in consultation with the department head. The remaining required credits are elective in the Department of Education. Students exempted from the completion of the prerequisite under-graduate courses on the ground of experience must complete graduate courses in the general history of education, educational psychology, and the principles of education; and all students are required to complete the regular graduate courses in the history of American education, educational sociology, and one other graduate course in the department of principles of education. Any or all of these courses may be included in the preceding requirements, subject to the conditions specified. Further, all candidates for the doctor's degree are required to give evidence of a good reading knowledge of the French and German language not later than one academic year before the degree is received. Every candidate must pass a satisfactory final examination before the faculty upon his major and minor subjects and his thesis, together with such final written examinations as may be required.

The Degree of Doctor of Philosophy. On the satisfactory completion of this curriculum the student is recommended for the University degree of Doctor of Philosophy.

APPLICATION

The attention of prospective students is directed to the following outline of the procedure of admission. By following these directions, confusion and delay will be avoided.

1. As soon as you reach a decision to enter, send to the Registrar, 109 State Hall, for an application blank upon which to enter your name, address, name of the school from which you have been graduated, and the *College Group* in which you desire to register. If you have completed two years of the prescribed college work, make a definite statement to the effect that you are prepared to enter the Junior class of the School of

Education, otherwise it will be assumed that you are an applicant for admission to the Freshman class.

2. Upon receipt of this form, the Registrar will send for the record of your preparatory education and after these credentials have been examined you will be notified concerning admission possibilities. If the entrance requirements have been satisfied a Registration Permit will be issued by the Registrar. This form must be presented at the time of registration.

3. Accompanying the Registration Permit will be a Vaccination Report Card. This form should be filled in and signed by the applicant's physician and returned at once to the Office of the Registrar. No registration will be allowed if this report is not filed.

REGISTRATION

Registration in the School of Education will be conducted Wednesday-Saturday, September 20-23. Candidates are advised to register early during the period as choice of sections in any of the courses will be possible only on condition of early registration.

TUITION AND FEES

The annual rate of tuition in the School of Education is \$212.50 payable in two installments, \$112.50 upon registration at the opening of the first semester and \$100.00 upon registration for the second semester.

The tuition for the first semester entitles the student to admission to all athletic events and certain other activities under the jurisdiction of the Advisory Board of Student Activities.

Full tuition is charged all students registering for twelve semester credits or more. The tuition charge for less than this number is at the rate of \$7.00 a credit.

Laboratory Fees covering the use of laboratories and equipment are charged in addition to the tuition as follows:

Biology	\$5.00 per semester for each course
Chemistry	7.50 per semester for each course
Physics	5.00 per semester for each course

A charge is made for laboratory supplies and other materials used in courses requiring them. Supply cards costing \$5.00 each are provided for this purpose, and must be obtained at the Office of the Treasurer at the time of registration.

A fee of \$5.00 is added to the tuition if registration is not completed within the dates specified.

A fee of \$5.00 is charged for each examination for advanced standing without regard to the number of credits involved. The same fee is charged for every re-examination.

A fee of \$10.00 for each diploma is due upon graduation. In the Graduate School an extra charge is made for the hood.

REFUNDS

No refund of tuition will be allowed if a student withdraws from a course after the middle of the semester. Application for refund will be considered only when made at the time of withdrawal.

HOUSING AND EMPLOYMENT BUREAU

The University inspects the boarding and rooming houses in the district and keeps a record of those which have been approved. During the week of registration a staff of workers assists students to find suitable lodgings and boarding places. At the time of the publication of this bulletin living expenses were reported to be as follows:

Per Week	Minimum	Average
Board	\$8.00	\$9.00—\$10.00
Room	\$3.50	\$4.00—\$ 5.00

These estimates are based upon actual facts, as discovered by careful investigation. There is, of course, a large personal variation in such expenses. To this estimate should be added the amount spent for laundry, amusement, etc.

Through the Employment Bureau every effort is made to help the student who is dependent upon his own resources. The Bureau has established definite relations with a large number of business and industrial concerns in the Pittsburgh district, and at the present time, these concerns depend almost entirely upon this agency to supply their part-time help. For information concerning this service apply to the Secretary of the Bureau, Room 1, State Hall.

TEACHER PLACEMENT SERVICE

The School maintains a teacher appointment bureau as a part of its public service. Its purpose is twofold: To aid its students in securing desirable positions, and to aid superintendents and principals in finding well-qualified teachers. The appointment bureau co-operates with the Placement Service of the State Department of Public Instruction at Harrisburg, thus offering additional facilities for the placement of teachers. No enrollment fee is required and no charges made for any service rendered by the bureau. Teachers and superintendents are asked to use the facilities of the bureau freely.

DEPARTMENT OF VOCATIONAL TEACHER TRAINING

The Department of Vocational Teacher Training was organized in September, 1918, following the action of the State Board for Vocational Education in appointing the University of Pittsburgh as its agent in the western region of Pennsylvania for the training of teachers under the terms of the Smith-Hughes Act.

The function of this Department is to provide instruction for prospective vocational teachers as well as for those already in service desiring to improve professionally.

Persons desiring admission to this department should confer with the Director of the Department of Vocational Teacher Training, University of Pittsburgh

COURSES FOR VOCATIONAL TEACHERS

1. Curricula leading to a degree for the following classes of teachers: (a) The teacher of vocational shop work. (b) The teacher of vocational related subjects. (c) The teacher of vocational home economics. (d) The teacher of general continuation school subjects.

On the satisfactory completion of any of the three curricula (a), (b), and (c) the student receives the University degree of Bachelor of Science in Vocational Education and college provisional certificate to teach; on the satisfactory completion of curriculum (d), the University degree of Bachelor of Science in Education and the college provisional certificate to teach.

2. Extension courses. The department will establish training centers in the western part of the state wherever the demand for courses justifies their establishment.

3. Evening Courses for the preliminary training of vocational teachers of shopwork and related subjects. Courses will be conducted in any center within the official territory of the Department where the demand for them warrants their maintenance. These courses are open to teachers in service.

The professional courses offered by this department are described in a separate bulletin. Apply to the Director of the Department of Vocational Teacher Training for a copy of this bulletin.

DESCRIPTION OF COURSES

In the following departmental statements of subject courses all undergraduate courses bear numbers below 100, all graduate courses bear numbers above 100, and courses regularly open to both undergraduate and graduate students bear between 100 and 200. All courses bearing odd numbers are regularly offered during the first semester, all those bearing even numbers are regularly offered during the second semester. Courses running continuously through the entire academic year bear two numbers, one for each semester. Not all the courses here listed are offered every year. Some of the less fundamental elective ones are more or less likely to be omitted in any year. So far as the courses to be omitted in 1922-1923 are known, the fact of such omission is indicated at the close of the several descriptions.

HISTORY AND PRINCIPLES OF EDUCATION

Assistant Professors Moore and Kennedy

61. INTRODUCTION TO TEACHING 1 sem., 3 crs.

For description of this course see Secondary Education.

66. SCHOOL HYGIENE 2 sem. 2 crs.

The location, construction, and upkeep of the school plant from sanitary and hygienic points of view. The proper means of humidifying, heating, ventilating, seating, lighting, etc. The proper periods of rest, study, and sleep; fatigue; care of the body; common diseases of children and the duties of the teacher relative thereto. Tu. 7:15 P. M. *Assistant Professor Moore.*

69. PRINCIPLES OF EDUCATION 1 sem. 2 crs.

The fundamental principles underlying educational theory and practice based on the study of both child development and the organization of the subject-matter of the curriculum. A consideration of education as the reorganization of experience thru the progressive adaptations of the individual, the social and individual aspects of education, the significance of motor activity in development, discipline, interest, educational values and motives. Tu. 7:15 P. M. *Assistant Professor Moore.*

101, 102. HISTORY OF EDUCATION 1 and 2 sem. 2 crs. ea.

This course considers what present day education owes to the great educational leaders from the time of Greek supremacy down to the present century. The constant aim is to trace development, find basic principles, and not memorize fact material. M. 4:30 P. M. *Assistant Professor Kennedy.*

109. SOCIOLOGICAL FOUNDATIONS OF EDUCATION 1 sem. 2 crs.

A course in the study of the sociological foundations of school organization, and procedure. A survey and summary of the social aspects of human nature and its development by means of education. W. 4:30 P. M. *Assistant Professor Moore.*

110. PROBLEMS IN EDUCATIONAL SOCIOLOGY 2 sem. 2 crs.

The evaluation and critical consideration of present and proposed curricula and school procedure based upon the principles of educational sociology and social research. The application of the science of sociology to social groups as educational units and their relationship to the needs of society and the state. W. 4:30 P. M. *Assistant Professor Moore.*

111. EDUCATION IN THE VICTORIAN NOVEL 1 sem. 2 crs.

A study of the origin, material and value of the novel in education. The educational contributions of Dickens, Eliot, Bronte, Thackeray, Hughes, Trollope, Lytton, and MacDonald will be considered. S. 10:30 A. M. *Assistant Professor Kennedy.*

113. 114. THE PRINCIPLES OF EDUCATION 1 and 2 sem. 2 crs. ea.

A course in which education is studied as a social agency in relation to other social factors. A consideration of the fundamental educational principles underlying twentieth century theory and practice in a democracy looking toward the construction of a satisfactory working theory of democratic education. S. 10:30 A. M. *Assistant Professor Moore.*

118. EDUCATION IN THE AMERICAN NOVEL 2 sem. 2 crs.

A study of the educational contributions of Stowe, Holland, Holmes, Eggleston, Howells, Mark Twain, Henry James, William Hawley Smith, Herbert Quick and other present day American novelists. S. 10:30 A. M. *Assistant Professor Kennedy.*

121. THE FAMILY AS AN EDUCATIONAL AND SOCIAL INSTITUTION

2 sem. 2 crs.

This course includes an historical survey of the evolution of the family with special emphasis on economic and social causes. A consideration of the present day family not only as the most important primary social group but also as a factor in educational and social progress. Th. 4:30 P. M. *Assistant Professor Moore.*

122. PUBLIC EDUCATION IN THE UNITED STATES

1 sem. 2 crs.

A consideration of the more important present day problems in the organization, administration and adjustment of public education in the United States studied in the light of their historical development. Th. 4:30 P. M. *Assistant Professor Moore*

123. DEMOCRACY AND NATIONALISM IN EDUCATION

1 Sem. 2 crs.

A consideration of the use of education in the recent development of nationality as shown by some of the leading modern nations. Special attention is given to education as the prime essential in the development of a democracy. S. 8:30 A. M. *Assistant Professor Moore.*

124. COMPARATIVE EDUCATION

2 sem. 2 crs.

A comparative study of the essential features of the more important modern educational systems as to organization, administration, curricula, methods and aims and their relation to present social conditions. S. 8:30 A. M. *Assistant Professor Moore.*

127. THE PLATOON PLAN OF SCHOOL ORGANIZATION

1 sem. 2 crs.

A study of the roots, organization, and problems of the platoon school. The opportunities for enrichment of the curriculum, for adaptations, to the needs of community and school of problems, and the economies resulting from this type of school, will be emphasized. S. 8:30 A. M. *Assistant Professor Kennedy.*

128. THE PLATOON PLAN OF SCHOOL ORGANIZATION

2 sem. 2 crs.

A detailed study of both the Academic and Special subjects of the curriculum thru lectures, demonstration lessons, readings and reports. S. 8:30 A. M. *Assistant Professor Kennedy.*

201, 202. SEMINAR IN HISTORY AND PRINCIPLES OF EDUCATION

1 and 2 sem. 2 crs. ea.

Studies and investigations in the field of the student's special interest. Schedule to be arranged. *Assistant Professor Moore.*

EDUCATIONAL ADMINISTRATION

Professor Davis: Dean Reavis, Assistant Professor Kennedy

102. SUPERVISION OF INSTRUCTION

2 sem. 2 crs.

An intensive study of those points which enter into evaluation of classroom work. A teacher's Improvement Score Card and an outline plan for evaluating instruction on the basis of controlling conditions are presented. S. 10:30 A. M. *Professor Davis.*

103. STATISTICAL METHODS APPLIED TO EDUCATION

1 sem. 2 crs.

An introductory course in the most widely used methods of handling quantitative data so that the significant facts are made evident. The topics emphasized are: central tendencies, variability, correlations, reliability, predictions, tabular forms, and their interpretation S. 8:30 A. M. *Professor Davis.*

104. STATISTICAL METHODS APPLIED TO EDUCATION

2 sem. 2 crs.

An introductory course in the most widely used methods of handling quantitative data so that the significant facts are made evident. The topics emphasized are: central tendencies, variability, correlations, reliability, predictions tabular forms, and their interpretation S. 8:30 A. M. *Professor Davis.*

107. CITY SCHOOL ADMINISTRATION

1 sem. 2 crs.

An informational course in which the most approved practices in administering city and village schools are summarized. The work is based upon Cubberley's *Public School Administration*, and assigned readings. T. 7:15 P. M. *Professor Davis.*

108. PROBLEMS IN CITY SCHOOL ORGANIZATION AND ADMINISTRATION

2 sem. 2 crs.

A series of case studies which help define certain problems in the management of city schools, and suggested standards for future procedure. The professional literature of the course is a library list of the reports of educational commissions and survey staffs. The studies relate to finance, buildings, research, organization, and the annual report. T. 7:15 P. M. *Professor Davis.*

109. THE SCHOOL PRINCIPAL

1 sem. 2 crs.

An advanced course open only to a limited number of school principals in service. The topics for study will be the immediate problems of the members of the group. The class will meet only at stated intervals, but the work will be directed personally by the instructor in the various schools represented. Suggested topics for study are: pupil ac-

counting, classification of pupils, directed study, marking systems, improvement of teaching, testing, and rating of teachers. Enrollment and credit by arrangement. Schedule to be arranged. *Professor Davis.*

110. THE SCHOOL PRINCIPAL 2 sems. 2 crs.

A continuation of course 109 but may be taken independently of it. Schedule to be arranged. *Professor Davis.*

115. EDUCATIONAL MEASUREMENTS 1 sem. 2 crs.

An introduction to the most widely accepted testing material for determining the efficiency of instruction. The emphasis is placed upon diagnosis and remedial measures. A nominal laboratory fee is charged for the material used by students. S. 10:30 A. M. *Professor Davis.*

116. EDUCATIONAL MEASUREMENTS 2 sem. 2 crs.

An introduction to the most widely accepted testing material for determining the efficiency of instruction. The emphasis is placed upon diagnosis and remedial measures. A nominal laboratory fee is charged for the material used by students. S. 10:30 A. M. *Professor Davis*

117. STATE AND COUNTY EDUCATIONAL ADMINISTRATION 1 sem. 2 crs.

An analysis of the facts and underlying theories of state and county control of education. A knowledge of such material contributes to an understanding and appreciation of education in democracy. The work is based upon Cubberley's *State and County Educational Organization*, Pennsylvania State School Code and other assigned readings. M. 7:15 P. M. *Professor Davis and Dean Reavis.*

118. PROBLEMS OF NATIONAL, STATE AND COUNTY EDUCATION 2 sem. 2 crs.

A Continuation of Course 117 including study of the outstanding legal provisions, and expert recommendations concerning educational organization and control in large units. The source material is a library list of the reports of State officials, commissions, and survey staffs. The studies relate to taxation, state support, legal limitations, pension systems, salary schedules, state institutions, and certification, county unit, rural schools. M. 7:15 P. M. *Professor Davis and Dean Reavis.*

127. THE PLATOON PLAN OF SCHOOL ORGANIZATION 1 sem 2 crs.

Same as History of Education 127. S. 8:30 A. M. *Assistant Professor Kennedy.*

205, 206. SEMINAR IN EDUCATIONAL ADMINISTRATION 1 and 2 sem. 2 crs. ea.

Open only to students prepared to make an intensive study of some particular phase of School Administration. The results must be filed in the library. W. 7:15 P. M. *Professor Davis.*

SECONDARY EDUCATION

Professors Buckner, Raschen, Sage, Webber, Assistant Professors Foulke, James, Zerbe.

61. INTRODUCTION TO TEACHING 1st sem. 3 crs. Repeated 2nd sem.

An antecedent perspective of school situations and the problems of teaching. The following topics are illustrative: Classroom routine, control of conduct, organization of subject matter, means and methods of adding knowledge, motivation of learning, assignment of lessons and direction of study, supervision of study habits, essentials of good questioning, individual differences, group and individual instruction, standards and measurements of instruction. Open only to students registered in the School of Education. M. W. F. 2:30 P. M. *Professor Buckner.*

91. OBSERVATION AND PRACTICE TEACHING 1st sem. 6 crs. Repeated 2nd sem

Directed observation of classroom teaching, lesson planning, actual teaching experience, constructive criticism by supervising teachers. One class conference weekly for reports, discussion, and lectures. Arranged through cooperation with high schools near the University. Open only to students registered in the School of Education. Schedule to be arranged *Assistant Professor Foulke.*

101, 102. HIGH SCHOOL ADMINISTRATION AND SUPERVISION

1 and 2 sem. 2 crs. ea.

101. Organization and Administration. The present status and function of secondary education; a detailed study of the work of the principal. S. 8:30 A. M.

102. Supervision of Instruction. Materials and methods that may be used by the principal in developing and maintaining efficient classroom instruction.

Offered primarily for experienced principals and superintendents, and for students preparing for such positions. S. 8:30 A. M. *Professor Buckner.*

103. SOCIAL ACTIVITIES OF THE HIGH SCHOOL 1st Sem. 2 crs.

Formal and informal activities and their possibilities for correlation with the social interests of the community; training of teachers for social leadership. Not given in 1922-1923.

105. THE JUNIOR HIGH SCHOOL 1st sem. 2 crs.

The reorganization of secondary education on this basis. The pupils and their needs, purposes of the school, materials and methods of instruction, school activities, evaluation of achievements, guidance, self improvement of teachers. M. 4:30 P. M. *Professor Buckner*

110. HIGH SCHOOL CURRICULA 2nd sem. 2 crs.

The purpose of a curriculum, its organization and administration; the contribution of specific subjects and extra-curricular activities; organi-

zation of materials of instructions; guidance in the selection of a curriculum. M. 4:30 P. M. *Professor Buckner.*

121, 122. METHODS OF TEACHING IN HIGH SCHOOLS

1st and 2nd sem. 2 crs. ea.

Evolution of the subjects, methods of teaching them, types of learning involved, relation to generally accepted principles of presentation. S. 10:30 A. M. *Assistant Professor Foulke.*

123, 124. MEASUREMENT OF HIGH SCHOOL PUPILS' ACHIEVEMENTS

1st and 2nd sem. 2 crs. ea.

123. Survey of Tests Designed for the High School. Derivation of such measures, their application, statistical methods involved, interpretation and use of results. W. 4:30 P. M.

124. Investigation Involving the Use of Tests. Intensive study by each member of the class of some problem in measurement in the field of major interest. W. 4:30 P. M. *Professor Buckner.*

127, 128 THE TEACHING OF ENGLISH

1st and 2nd sem. 2 crs. ea.

Aims, methods, and values of secondary school English; reading and analysis of representative selections from the college entrance requirements. Required of students majoring in English. Prerequisite: English 1, 2, in the College, or the equivalent. T. Th. 10:30 A. M. also S. 10:30 *Assistant Professor Zerbe.*

141, 142. THE TEACHING OF LATIN

1st and 2nd sem. 2 crs. ea.

Intelligent and attractive presentation of material; pronunciation, reading, scansion; consideration of points to be emphasized; measurement of results. Prerequisite: Junior standing. T. Th. 1:30 P. M. *Professor Sage.*

155, 156. THE TEACHING OF MODERN LANGUAGES 1 and 2 sem. 1 cr. ea.

Lectures, reports, and discussions of the various methods of teaching modern languages. Courses of study, textbooks, and supplementary materials are considered. S. 10:30 A. M. *Professor Raschen.*

161, 162. THE TEACHING OF SOCIAL STUDIES

1 and 2 sem. 2 crs. ea.

The field and importance of social studies, course organization, textbook selection, method of presentation, class work, and special problems in the teaching of the social studies. T. Th. 2:30 P. M. *Assistant Professor James.*

171, 172. THE TEACHING OF MATHEMATICS

1 and 2 sem. 1 cr. ea.

The values of mathematics; a rational psychological theory as a basis for the teaching of mathematics; methods of presentation; courses of study and textbooks.

Prerequisite: One year of College mathematics. S. 9:30 A. M. *Professor Webber.*

181, 182. THE TEACHING OF SCIENCE

1 and 2 sem. 2 crs. ea.

The basic pedagogy of secondary school science subjects. Selection, organization and presentation of subject matter. Review of introductory courses in sciences taught in high schools. S. 8:30 A. M.

201, 202. RESEARCH COURSE IN SECONDARY EDUCATION

1 and 2 sem. 2 crs. ea.

Intensive study of a problem in the field of the student's major interest. Special attention given to methods of research. Offered for graduate students who elect Secondary Education for the major or the minor subject. S. 10:30 A. M. *Professor Buckner*

ELEMENTARY EDUCATION

Professor Hunt, Assistant Professor Carmalt and Miss Harris

37, 38 PROBLEMS IN ELEMENTARY EDUCATION

1 and 2 sem. 2 crs. ea.

This is an introductory course covering problems of study, the efficient organization of routine, the development of ideals and control of conduct, and the kinds of projects. The bibliography will include the recent literature on these and related topics. S. 10:30 A. M. *Assistant Professor Carmalt.*

43, 44. CHILDREN'S LITERATURE

1 and 2 sem. 2 crs. ea.

A study of literature for children. Folk tales, myths, fables, legends, realistic stories, animal stories, rhymes and poems. A careful consideration of the selection and presentation of the most suitable materials and how to develop an appreciation for the best. Readings, lectures, discussions, and actual practice in story telling. S. 10:30 A. M. *Miss Harris.*

45, 46. METHODS FOR PRIMARY GRADES

1 and 2 sem. 2 crs. ea.

This course summarizes methods of teaching in the primary grades. Special attention will be given to the selection and presentation of materials in the light of the ability and interests of children in the first four grades. Desirable procedures in the teaching of reading and arithmetic will be stressed. Readings, discussions, and reports. S. 8:30 A. M. *Miss Harris.*

47, 48. METHODS FOR THE UPPER ELEMENTARY GRADES 1 & 2 sem 2 crs. ea.

This course summarizes the teaching of children in the elementary school above the primary grades. Attention will be given to a discussion of such topics as: Types of recitations, supervised study, socialized drill, development lessons, and lessons for appreciation; the use of textbooks. Lessons in the various elementary school subjects will be developed to illustrate modern methods.

51, 52. THE TEACHING OF LANGUAGES

1 and 2 sem. 2 crs. ea.

This course includes a survey of the literature on the teaching of language with special attention to recent experiments and constructive work in this field. Thoroly practical work in oral and written composi-

tion; the relation of reading and thought-getting to ability in language; the use of children's natural interests in effective language teaching—all will receive due attention. T. 7:15, P. M. *Assistant Professor Carmalt.*

67, 68. TEACHING OF GEOGRAPHY AND HISTORY 1 and 2 sem. 2 crs. ea.

This course treats the inter-relation of geography and history as taught in the Elementary School and also will develop an organization of type studies and projects in both subjects. Evidence of cause and effect running through the two subjects will be emphasized and the minimum essentials in both will be worked out. This course conforms with the new course of study now in preparation in the Pittsburgh Schools. S. 8:30 A. M. also M. 4:30 P. M. *Assistant Professor Carmalt.*

71, 72. THE TEACHING OF READING AND LITERATURE 1 and 2 sem. 2 crs. ea.

The pedagogy of reading in the intermediate and upper grades, based on psychology; reading as a tool of experience, literature as a means of stimulating culture and the enrichment of life. M. 7:15 P. M. *Assistant Professor Carmalt.*

103. PROJECTS AND THE PROJECT METHOD 1 sem. 2 crs.

An advanced course in which the project method is analyzed and evaluated as a means of developing initiative, resourcefulness, independence, cooperation, and organizing ability, on the part of the pupils; and as a means of handling large units of subject matter effectively. Th. 7:15 P. M. *Miss Harris.*

104. PROJECTS AND THE PROJECT METHODS 2 sem. 2 crs.

A continuation of Course 103. Preparation of definite plans, procedures, organization for cooperative work, nature of the teacher's supervision, organization of material, and listing projects for the various grades form the basis of the class work. Th. 7:15 P. M. *Miss Harris.*

105, 106. CURRICULUM OF THE ELEMENTARY SCHOOLS—The SIX-SIX PLAN 1 and 2 sem. 2 crs. ea.

A study of curriculum with reference to organization and adaptability of material for the Six-Six Plan. Standards of achievement will be based on quantitative studies. M. 7:15 P. M.

107, 108. METHODS IN CHARACTER BUILDING 1 and 2 sem. 2 crs. ea.

The analysis of common errors in parental and school control looking toward the development of rational methods for increasing the effectiveness of the school in character building will be studied and a graded course of study worked out. Attention will be given to children's interest in the various stages of child development. W. 7:15 P. M. *Assistant Professor Carmalt.*

117. READING IN THE PRIMARY GRADES 1 sem. 2 crs

This course includes a scientific study of the problems of teaching reading in first three grades involving methods of beginning reading,

values and methods in silent reading, standards of achievements in different grades, use of tests and a study of readers and types of reading material. S. 10:30 A. M.

118. READING IN THE PRIMARY GRADES 2 sem. 2 crs.

Same as 117, but given the second semester. S. 10:30 A. M.

119. ARITHMETIC IN THE ELEMENTARY SCHOOL 1 sem. 2 crs

This course treats the specific difficulties involved in learning (teaching) arithmetic in the first six grades. Thorndyke's *Psychology of Arithmetic* and *The New Methods in Arithmetic* will be used as a basis for the work. Attention will be given to the best methods of building the hierarchy of habits involved in any easy control of the mechanics of arithmetic, as well as providing for economy of time in mastering the thought processes. S. 8:30 A. M.

120. ARITHMETIC IN THE ELEMENTARY SCHOOL 2 sem. 2 crs.

Same as 119, but given the second semester. S. 8:30 A. M.

Professors Fettermann, Fish, and Jennings; Assistant Professors Collins, Emig, and Wallgren; Messrs. Adolph, Cartledge, Emerson, and Smith; Miss Graham.

The following courses, offered in The College, may be counted in satisfying degree requirements in the School of Education:—

ASTRONOMY

PROFESSOR CURTIS

1, 2. GENERAL ASTRONOMY 1 & 2 Sem. 3 cr. ea.

A course in Descriptive Astronomy, based upon Young's Manual.

3. SPHERICAL ASTRONOMY 1st Sem. 3 cr.

The use of instruments; the determination of time, latitude, longitude, practical work. Prerequisite: Astronomy 1-2.

BIOLOGICAL SCIENCES

BOTANY

1. GENERAL BOTANY (Plant Biology) 1st Sem. 4 cr., repeated 2nd Sem.

Introductory. Fundamentals of plant form, function, evolution, relation to surroundings, general biological principles, and economic application. Prerequisite to all other Botany excepting courses 5, 6, and 9, 10. *Professors Jennings and Fettermann; Mr. Cartledge and others.*

2. GENERAL BOTANY (Plant Biology) 2nd Sem. 4 cr., repeated 1st Sem.

Continuation of 1, considerable time being devoted to systematic botany; study of important plant families and identification of plants. *Professor Jennings; Mr. Cartledge and others.*

3, 4. ADVANCED GENERAL BOTANY

1 & 2 Sem. 2 cr. ea.

Supplementary to Botany 1 and 2. Text, lecture, and laboratory. Should ordinarily precede or be taken at the same time with Botany 21 and 22. *Professors Jennings and Emig; Mr. Cartledge.*

5, 6. NON-TECHNICAL BOTANY

1 & 2 Sem. 2 cr. ea.

Lectures in the field of applied botany, including forestry, horticulture, gardening, floriculture, landscape gardening, and certain important plant industries. Prerequisite: none. *Professor Emig.*

9, 10. ELEMENTARY BIOLOGY (Saturday Course)

1 & 2 Sem. 3 cr. ea.

General course in Biology covering in abbreviated form the field of Botany 1 and Zoology 1. Four hours lecture and laboratory each Saturday. Prerequisite: none. *Mr. Smith and Assistant.*

21. PLANT HISTOLOGY

1st Sem. 4 cr.

Methods of preparing temporary and permanent microscopic mounts. Laboratory exercise with the glycerine, turpentine, paraffin, and celloidin methods. Prerequisite: 8 credits in Botany, with satisfactory grades; Chemistry 1-2. *Professor Emig.*

22. PLANT CYTOLOGY

2 Sem. 4 cr.

A detailed study of different types of cells and cell divisions. Material prepared in laboratory will illustrate various phases in the embryological development of plants. Prerequisite: Botany 21. *Professor Emig.*

33, 34. SYSTEMATIC BOTANY

1 & 2 Sem. 2 cr. ea.

Lectures, text assignments, field and herbarium work, and herbarium methods. Taxonomic studies of plant groups; identification; preparation and arrangement of plants in the herbarium. Prerequisite: Botany 1 and 2. *Professor Jennings.*

41, 42. MICROBIOLOGY

1 & 2 Sem. 4 cr. ea.

A general study of micro-organisms, with textbook, lectures, and laboratory work. Prerequisite: 8 credits in Biology, with satisfactory grades, Chemistry 31-32. *Professors Fettermann and Wallgren and Assistant.*

121, 122. PLANT HISTOLOGY AND CYTOLOGY

1 & 2 Sem. 4 cr. ea.

Primarily for Graduate Students. Prerequisite: 18 credits in Botany, with satisfactory grades; Chemistry 1-2. *Professor Emig.*

125, 126. PLANT ECOLOGY AND PLANT GEOGRAPHY

1 & 2 Sem. 2 cr. ea.

Lectures, textbook, and field work relating to the adjustment of plants to their surroundings; plant societies; and the distribution of plants geographically. Prerequisite: Botany 1, 2, and 21; Geology 1 or Geography 101; Chemistry 1-2. *Professor Jennings.*

139, 140. INDIVIDUAL WORK

1 & 2 Sem. variable cr.

Special studies or investigations or short problems by qualified

students. Prerequisite: 18 credits in Botany, other prerequisites depending on the nature of the work to be undertaken. *Professors Fettermann, Jennings, Wallgren and Emig.*

141, 142. ADVANCED MICROBIOLOGY 1 & 2 Sem. 4 cr. ea.
Prerequisites: Botany 41-42. *Professor Wallgren.*

145, 146. LABORATORY METHODS IN MICROBIOLOGY 1 or 2 Sem. 3 cr.
Primarily for Graduate Students. Prerequisite: 18 credits in Biology with satisfactory grades; Chemistry 31-32. *Professor Wallgren.*

147, 148. BOTANICAL SEMINAR 1 & 2 Sem. 1 cr. ea.
Preparation of reviews and abstracts of current literature and reports and discussions of current investigations. Prerequisite: 18 credits in Botany with satisfactory grades. *Professors Jennings and Emig.*

103, 104. PALEOBOTANY 1 & 2 Sem. 2 cr. ea.
Lectures, textbooks, laboratory work, and assigned readings. Practical identification of plant fossils and their relation to botanical and geological problems. Prerequisite: Botany 1, 2, 3-4, and 21; Geology 1. *Professor Jennings.*

ZOOLOGY

1, 2. GENERAL ZOOLOGY (Animal Biology) 1 & 2 Sem. 4 cr. ea.

Beginners' course, introductory to advanced courses. Structure, function, development, organization and evolution of animals, (some parallel studies of plants). Two lecture hours and two three-hour laboratory periods weekly. *Professor Fish and Staff.*

3, 4. Same as 1 and 2 Beginning 2nd semester. 1 & 2 Sem. 4 cr. ea.
Miss Graham assisted by Staff.

5. EVOLUTION AND HEREDITY 1st Sem. 3 cr. repeated 2nd Sem.
Lectures concerning inorganic, organic and social evolution, acquired characters, alternative inheritance, eugenics and biometry. No prerequisite. *Professor Fish and Assistants.*

7, 8. COMPARATIVE VERTEBRATE EMBRYOLOGY AND ANATOMY 1 & 2 Sem. 4 cr. ea.

Detailed comparative studies of embryonic and adult forms, their organs and organ systems. Second semester major emphasis on mammals. One or two lecture or quiz hours and two three or four-hour laboratory periods weekly. Prerequisite: C grade in Zoology 1 or 4 and five other periods weekly. Prerequisite: C grade in Zoology 1 or 4 and five other Botany or Zoology credits. *Professor Collins and Assistants.*

21, 22. FIELD ZOOLOGY (Ecology) 1 & 2 Sem. 4 cr. ea.

Studies of living material in the field, supplemented by laboratory work, lectures and a critical review of literature. The relationships of

animals to each other and their surroundings. Two lecture and two three-hour laboratory periods or field trips weekly. Prerequisite: Zoology 1 or 4; or teaching experience as approved by the Instructor. *Mr. Emerson and Assistants.*

81. HISTORY

1st Sem. 4 cr.

Laboratory technique, descriptive illustration, tissue classification, analysis and comparative morphological study of tissue complexes. One or two lecture hours and two three or four-hour laboratory periods weekly. Prerequisite: Zoology 1 or 4 and three credits in Botany or Zoology. *Miss Graham and Assistants.*

115. INVERTEBRATE BIOLOGY

1st Sem. 4 cr.

Structure, functions, and organization of animals. Lectures, conferences, laboratory dissection, and simple experiments. Prerequisite: Two semesters of Botany or Zoology. *Dr. Adolph.*

151. PARASITOLOGY (Protozoa and Helminths)

1st Sem. 4 cr.

Classification, life histories, scientific and economic importance. Two lecture hours and two three-hour laboratory periods weekly. Prerequisite: Zoology 1-2; Chemistry 1-2. *Professor Collins.*

164. GENERAL PHYSIOLOGY

2nd Sem. 4 cr.

Chemical and physical aspects of vital activities; analysis of the fundamental phenomena of growth, nutrition, respiration, movement, secretion, irritability, conduction. Laboratory studies of common plants and animals. Two lectures, 6 hours of laboratory weekly. Prerequisite: Three semesters of Botany or Zoology. *Dr. Adolph.*

173, 174. EXPERIMENTAL GENETICS

1 & 2 Sem. variable cr.

Laboratory exercises and special assignments on experiments being conducted by the staff. Prerequisite: Previous work in Genetics. *Professors Fish and Collins; Mr. Cartledge, and Miss Graham.*

185, 186. PALEOZOLOGY

1 & 2 Sem. 2 cr. ea.

General survey and information essential to field workers. Two lecture hours weekly. Prerequisite: The Department recommends ten credits in general Zoology. *Professor Ortmann.*

189, 190. INDIVIDUAL WORK

1 & 2 Sem. variable cr.

Individual preparation for investigations. Prerequisite: Approval of the staff. *Professor Fish and Staff.*

197, 198. ZOOLOGICAL SEMINAR

1 & 2 Sem. variable cr.

Critical review and discussion of biological literature, topically considered. Prerequisite: Approval of the staff. One two-hour meeting weekly. *Dr. Adolph assisted by the Staff.*

CHEMISTRY

Students majoring or specializing in Chemistry should elect subjects designated under Group IV, in their freshman and sophomore years. Those specializing in Chemistry should take during their junior year 16 credits each semester in the following courses; **German Ch. 3, 4 or French I, 2 or 3, 4; Chemistry 11, 12; 23, 24, 27, and 31, 32; Mechanical Engineering (second semester).

They should take during their senior year, 17 credits each semester in the following courses; German Ch. 5, 6; Chemistry 33, 34; 41, 42; 61, 62; and 71, 72; advised electives, 3 credits each semester.

*1, 2. GENERAL INORGANIC CHEMISTRY 1 & 2 Sem. 4 cr. ea.

A study of the metals, non-metals, principles, theories and calculations. Visits are made to a number of manufacturing establishments. A conference is held weekly to give the student an opportunity to present any questions which may arise. Two lectures, two recitations, two two-hour laboratory periods a week. *Professor Silverman; Messrs. Tesh, King, Sutton, and Herron and Assistants.*

11, 12. INORGANIC CHEMISTRY 1 & 2 Sem. 2 cr. ea

This course supplements the work in course 1, 2, which is prerequisite. It deals especially with modern chemical theory. *Professor Silverman.*

*21. QUALITATIVE ANALYSIS 1st Sem. 4 cr.

The reactions employed in qualitative analysis for the detection and separation of the common metals and acids are studied from the standpoint of electrolytic dissociation and chemical equilibrium. One lecture, one recitation and two three-hour laboratory periods a week. Prerequisite: Chemistry 1-2. *Professor Engelder; Mr. Hjort and Assistants.*

*22. QUANTITATIVE ANALYSIS 2nd Sem. 4 cr

A short course aiming to acquaint the student with the principal methods of gravimetric and volumetric analysis by means of carefully selected laboratory exercises. One lecture, one recitation and two three-hour laboratory periods a week. Prerequisite: Chemistry 1-2 and 21. *Professor Engelder, Mr. Hjort and Assistants.*

*23. ADVANCED QUANTITATIVE ANALYSIS 1st Sem 4 cr.

Theory and laboratory practice of analytical methods, with special attention to volumetric processes. Two lectures and two three-hour laboratory periods a week. *Professor Engelder and Mr. Hjort*

*Repeated in the Summer Term of eight weeks. The student is given an opportunity to complete a full year's work by devoting his time exclusively to one course and attending daily from 8 A. M. to 1 P. M. This offer is made especially for teachers.

**Students offering 3 units of entrance credits in German are required to take courses in French and vice versa.

*24. METALLURGICAL ANALYSIS

2nd Sem. 4 cr.

The analysis of iron, steel, brass, and other alloys; ores and minerals; slags, etc. Two lectures and two three-hour laboratory periods a week. *Professor Engelder and Mr. Hjort.*

27. FUEL ANALYSIS

1st Sem. 3 cr.

The analysis of natural gas, artificial gas, flue gases and gas calorimetry; the analysis and calorimetry of coal and the analysis and physical testing of oils. One lecture and two three-hour laboratory periods a week. Prerequisite: Chemistry 21-22. *Professor Engelder.*

28. ANALYSIS AND TESTING OF PETROLEUM PRODUCTS

2nd Sem. 3 cr.

The composition, analysis and physical testing of natural gas, crude petroleum, motor fuels, burning and fuel oils, lubricants, waxes, and asphalts. One lecture and two three-hour laboratory periods a week. *Professor Engelder.*

*31, 32. ORGANIC CHEMISTRY

1 & 2 Sem. 4 cr. ea.

An introduction to the chemistry of the compounds of carbon including the preparation of a large number of typical carbon compounds and a study of their properties, reactions and uses. Two lectures, two three-hour laboratory periods a week. Prerequisites: Chemistry 1-2, 21, and 22. Prospective medical students may be admitted without Chemistry 21 and 22. *Professor Lowy, Mr. Baldwin and Assistants.*

33, 34. ADVANCED ORGANIC CHEMISTRY LECTURE

1 & 2 Sem. 2 cr. ea.

A more detailed survey of the subject. *Professor Lowy.*

39. THE CHEMISTRY OF HYDROCARBONS

1st Sem. 4 cr.

This course is designed for students in the School of Mines. Special emphasis is laid on occurrence, preparation, properties and uses of hydrocarbons. Prerequisite: Chemistry 1-2. Two lectures and two three-hour laboratory periods a week. *Professor Lowy and Mr. Baldwin.*

*41, 42. PHYSICAL CHEMISTRY

1 & 2 Sem. 3 cr. ea.

A study of the laws governing chemical phenomena. Two lectures and one three-hour laboratory period a week. Prerequisite: Chemistry 21 and 22 and Mathematics 21-22, and 9-10 or 23-24. *Professor Stegeman and Mr. Young.*

61, 62. FOOD AND SANITARY CHEMISTRY

1 & 2 Sem. 4 cr. ea.

Two lectures and two three-hour laboratory periods a week. Prerequisite: Chemistry 21, 22, and 31-32. *Professor Bashioum.*

*71, 72. INDUSTRIAL CHEMISTRY

1 & 2 Sem. 3 cr. ea.

This course consists of a series of lectures on the problems associated with the manufacture of chemical products. The course is supplemented

*Repeated in the Summer Term of eight weeks. The student is given an opportunity to complete a full year's work by devoting his time exclusively to one course and attending daily from 8 A. M. to 1 P. M. This offer is made especially for teachers.

by numerous visits to manufacturing establishments in the Pittsburgh district. Prerequisite: Chemistry 11-12, 21, 22, and 31-32. *Professor Bashoum*

For Graduate Courses see Graduate School Bulletin.

ECONOMICS

3, 4. PRINCIPLES OF ECONOMICS 1 & 2 Sem. 3 cr. ea.

The basic concepts of economics, analysis and critique of the present economic organization. This course is prerequisite to other courses in the department. *Professors McKay and Tyson.*

E3. PRINCIPLES OF ECONOMICS 1st Sem. 3 cr.

An introduction to the fundamental principles of economics, designed especially for students who contemplate entering the School of Engineering.

7. ECONOMIC PROBLEMS 1st Sem. 2 cr.

Analysis of current economic issues of reconstruction policy, railroad efficiency, price adjustment and market conditions. *Professor McKay.*

8. IMMIGRATION 2nd Sem. 2 cr.

History and problems of immigration. Economic factors in immigrant assimilation. *Professor Tyson.*

15, 16. SOCIAL ECONOMICS 1 & 2 Sem. 3 cr. ea.

Influences affecting public welfare, poverty, disease and crime, economic backgrounds, and programs. *Professor Tyson.*

21, 22. INDUSTRIAL RELATIONS 1 & 2 Sem. 3 cr. ea.

Issues in the relation of employer and employee. Labor organization and legislation. Employer's experiments. *Professor Tyson.*

23, 24. PUBLIC FINANCE 1 & 2 Sem. 3 cr. ea.

Federal and State taxation and expenditure. Budget systems of the United States and other countries. *Professor McKay.*

31, 32. ECONOMIC RESEARCH 1 & 2 Sem. 2 cr. ea.

Surveys and statistics. Methods and practice of gathering and presenting economic and social facts.

101, 102. HISTORY OF ECONOMIC THOUGHT 1 & 2 Sem. 2 cr. ea.

A review of the history and literature of economics. Recent economic theories. (Not given 1922-23). *Professor McKay.*

103, 104. EVOLUTION OF ECONOMIC SOCIETY 1 & 2 Sem. 2 cr. ea.

A critique of economic interpretations. Rise of industrial society and its cultural consequences. *Professor Tyson.*

105, 106. MODERN ECONOMIC THOUGHT 1 & 2 Sem. 2 cr. ea.

A study of the more recent tendencies in economic theory. *Professor McKay.*

ENGINEERING

CIVIL ENGINEERING

I. ENGINEERING DRAWING 1st Sem. 1 cr., repeated 2nd Sem.

A course in Orthographic and Isometric projections with their inter-relations. Special attention given to lettering. Three laboratory hours a week. *Mr. Edgar.*

2. ENGINEERING DRAWING 2nd Sem. 1 cr.

A continuation of Graphics 1 with special emphasis on the requirements of drafting room practice. Prerequisite: Graphics 1. Three laboratory hours a week. *Mr. Edgar.*

3. DESCRIPTIVE GEOMETRY 1st Sem. 2 cr., repeated 2nd Sem.

A theoretical study of the science of representing by drawing the location of points, lines, planes, intersection of surfaces, shades and shadows, together with a study of the practical applications of these theories. Prerequisite: Graphics 2. One recitation and three laboratory hours a week. *Mr. Edgar.*

II. PLANE SURVEYING 1st Sem. 2 cr., repeated 2nd Sem.

Elementary course, involving use and care of surveying instruments. Simple field exercises and office computations. Prerequisite: Trigonometry. One recitation and three laboratory hours a week. *Professors McCandliss and McIntyre.*

#MECHANICAL ENGINEERING

I. ELEMENTARY MECHANICAL LABORATORY 1st Sem. 1 cr.

The principles of foundry, forge and machine practice. Three laboratory hours a week. *Professor Weber and Assistants.*

2. ELEMENTARY MECHANICAL LABORATORY 2nd Sem. 1 cr.

A continuation of M. E. 1. Three laboratory hours a week. *Professor Weber and Assistants.*

4. ELEMENTARY HEAT POWER ENGINEERING

2nd Sem. 3 cr., repeated 1st Sem.

An introductory course in power plants. Two recitations and three laboratory hours a week. *Professor Boyle.*

#These courses do not carry credit toward a college degree.

ENGLISH LANGUAGE AND LITERATURE

1, 2. ENGLISH COMPOSITION

1 & 2 Sem. 4 cr. ea.

A study of the principles of Composition, with frequent practical exercises in expository writing, analysis of models, and individual criticism. A survey of the progress of civilization, with the object of orienting first-year students in the field of learning and of helping them to discover their individual interests. Required of all freshmen.

3, 4. ENGLISH LITERATURE

1 & 2 Sem. 3 cr. ea.

A study of selected masterpieces of English Literature, representing the successive periods from the earliest times to the age of Victoria. Prerequisite: English 1-2. *Professors Arnold, Bailey, and Miller; Mr. Burgum.*

5, 6. AMERICAN LITERATURE

1 & 2 Sem. 3 cr. ea.

A survey of American Literature, with especial attention to the great writers of the National Period. Prerequisite: English 1-2. *Professor Zerbe.*

17, 18. SHAKESPEARE

1 & 2 Sem. 3 cr. ea.

A study of Shakespeare's development in technique and in the treatment of character; rapid reading of the more important plays of Shakespeare and of a few by his contemporaries; informal class discussions, lectures, and occasional written reports and themes. Prerequisite: English 1-2, and one of the following groups: 3-4, 5-6, 7-8, or 15-16.

19, 20. GREEK LITERATURE IN ENGLISH

1 & 2 Sem. 2 cr. ea.

(See Greek 19, 20).

29, 30. VICTORIAN POETRY

1 & 2 Sem. 3 cr. ea

A study of the major poets of the period 1830-1890, with especial attention to Tennyson, Browning, and Arnold. Prerequisite: English 1-2 and 3-4.

33, 34. SHORT STORY WRITING

1 & 2 Sem. 2 cr. ea.

A study of the principles of story writing, analysis of masterpieces, practice in original composition, criticism. Prerequisite: English 1-2.

39. CHAUCER

1st Sem. 3 cr.

A study of the *Canterbury Tales Prologue, Nun's Priest's Tale, Knight's Tale, Man-of-Law's Tale, Clerk's Tale*. Appreciation of the narrative art of the author, and some study of his sources and of his relations to his contemporaries and his age. Prerequisite: English 1-2 and 3-4. *Professor Miller.*

40. THE ESSAYS OF BACON 2nd Sem. 3 cr.

A study of the essays of Francis Bacon as philosophical reflections on life, in the light of his experiences and of the times. Prerequisite: English 1-2 and 3-4. *Professor Miller.*

47, 48. CONTEMPORARY DRAMATISTS 1 & 2 Sem. 2 cr. ea.

A study of representative plays by Ibsen, Hauptmann, Maeterlinck, Rostand, Phillips, William Vaughn Moody, and others. Prerequisite: English 1-2 and 3-4.

53, 54. ADVANCED ENGLISH COMPOSITION 1 & 2 Sem. 2 cr. ea.

The course is intended for students who write well, but who desire practice under criticism, and for students who have attained distinction in English or in other ways have shown exceptional literary faculty. Open to students who obtain consent of the instructor in charge. *Professor Arnold.*

55, 56. THE ENGLISH NOVEL 1 & 2 Sem. 2 cr. ea.

A study of the historical development of the English novel from the Eighteenth Century beginnings to George Meredith. Lectures, library reading, and written reports. Prerequisite: English 1-2 and 3-4. *Professor Bailey.*

67, 68. THE AMERICAN HISTORICAL NOVEL 1 & 2 Sem. 2 cr. ea.

A study of American history as represented in the historical novel. Lectures, library readings, papers. Prerequisite: English 1-2 and 5-6. *Professor Zerbe.*

71, 72. THE BIBLE IN ENGLISH LITERATURE 1 & 2 Sem. 2 cr. ea.

A study of the influence of the Bible on English Literature, from the literary rather than the theological point of view. Prerequisite: English 1-2 and 3-4. *Professor Bailey.*

105, 106. INTRODUCTION TO THE SCIENCE OF LANGUAGE 1 & 2 Sem. 2 cr. ea.
(See Modern Languages 105, 106).

127, 128. THE TEACHING OF ENGLISH 1 & 2 Sem. 2 cr. ea.

A study of the aims, methods, and educational values of the secondary school course in English, with reading and analysis of representative selections from the list of college entrance requirements. Prerequisite: English 1-2 and 3-4 or 5-6. Required of students in the School of Education who take their major work in English. *Professor Zerbe.*

131, 132. OLD ENGLISH 1 & 2 Sem. 2 cr. ea.

A study of the earliest forms of English speech, with attention to the history of the inflections; rapid reading of a considerable body of English prose and poetry. Text-books: Bright's *Anglo-Saxon Reader*, selected texts of the Caedmonian and Cynewulf cycle. Prerequisite: English 1-2 and 3-4. Elective for students whose major work is in English. *Professor Miller.*

135, 136. THE WORKS OF THOMAS CARLYLE 1 & 2 Sem. 1 cr. ea.

A study of the political and social writings of Carlyle and of their moral and religious implications and sources, with special consideration of *Sartor Resartus*, *Chartism*, *Past and Present*, and *Latter Day Pamphlets*; study of Carlyle's historical works with reference to his criticisms of the social order. Prerequisite: English 1-2 and 3-4. Open to seniors and Juniors with the consent of the instructor.

137, 138. THE WORKS OF JOHN RUSKIN 1 & 2 Sem. 1 cr. ea.

A study of the literary career of Ruskin, with especial reference to the formation and development of his social and political philosophy in its relations with art, religion, the development of the English industrial system and of democratic government; comparisons between the doctrines of Ruskin and those of Carlyle, Mill, and Spencer; study of the influence of Ruskin and of the bearings of his doctrines on the social problems of the present. Prerequisite: English 1-2 and 3-4. Open to seniors and juniors with the consent of the instructor. *Professor Miller*.

201, 202. LITERARY CRITICISM 1 & 2 Sem. 2 cr. ea.

A study of the principles of literary criticism, with a brief historical survey of the leading critics of classical antiquity and of England in the Sixteenth, Seventeenth and Eighteenth Centuries. Open to graduate students, and to seniors and juniors with the consent of the instructor.

PUBLIC SPEAKING

1, 2. EFFECTIVE SPEAKING 1 & 2 Sem. 2 cr. ea.

The principles of effective speaking and their application in original work. *Professor Lane*.

3, 4. PARLIAMENTARY PROCEDURE AND EXTEMPORANEOUS SPEAKING 1 & 2 Sem. 2 cr. ea.

A presentation of the rules governing parliamentary procedure and practice as chairman and secretary in the conduct of a public meeting. Practice in extemporaneous speaking is afforded on various topics of current interest by the introduction of these topics as motions, which are discussed, amended, postponed, adopted or rejected by the meeting. Prerequisite: Public Speaking 1-2. *Professor Lane*.

5, 6. THE SPEECH FOR SPECIAL OCCASIONS 1 & 2 Sem. 2 cr. ea.

A study of specimens of public address illustrating the speech in behalf of a cause, as president of an organization, as representative of a society to welcome an individual or a group or to bid farewell to a community, as speaker accepting a gift or presenting one to an individual or a society, and as political or official representative on various occasions. Prerequisite: Public Speaking 1-2. *Professor Lane*.

7, 8. ARGUMENTATION

1 & 2 Sem. 2 cr. ea.

A study of the principles underlying the settlement of differences of opinion and practical exercises in analysis, briefing, and original articles. The emphasis is placed, not upon oral presentation, but upon the principles of analysis, brief-making, evidence, and effective presentation of argumentative material.

9, 10. THE TEACHING OF READING

1 & 2 Sem. 2 cr. ea.

Methods of teaching reading and their application in selections commonly used in the secondary schools. *Professor Lane.*

11. LYRIC POETRY

1st Sem. 2 cr.

The principles of vocal interpretation and their application to some of the great short poems of English and American literature. *Professor Lane.*

12. SHAKESPEARE

2nd Sem. 2 cr.

An intensive study of several plays of Shakespeare for oral interpretation.

13, 14. MODERN DRAMA

1 & 2 Sem. 2 cr. ea.

The vocal interpretation of several modern dramas by the class and the presentation of an entire play by each individual. *Professor Lane.*

GEOGRAPHY

Professor Ortmann

101. PHYSIOGRAPHY OF LANDS

1st Sem. 2 cr.

A course, largely descriptive, acquainting the student with the chief characteristics of the land's surface and their scientific terminology.

102. OCEANOGRAPHY AND CLIMATOLOGY

2nd Sem. 2 cr.

Descriptive treatment of the chief features of the sea. Physical conditions of the atmosphere, chiefly with regard to temperature, precipitation, and general circulation of air currents. Principles of Meteorology. Prerequisite: Geography 101.

103. ADVANCED PHYSICAL GEOGRAPHY

1st Sem. 2 cr.

Treating of the causes and the origin of the existing land-forms, showing how the land is formed, and how air, water, ice, etc. are changing its original condition. Prerequisite: Geography 101 and 102, Geology 1-2. -

104. PALEOGEOGRAPHY

2nd Sem. 2 cr.

The history of the earth, with reference to the development of the external features of the distribution of land and water, tracing the origin and changes of continents and oceans through the different geological ages up to the present conditions. Prerequisite: Geography 103.

GEOLOGY

Professors Fettermann and Jennings

I. PHYSICAL GEOLOGY

1st Sem. 3 cr.

A general introduction to dynamic and structural geology, stressing particularly the kinds of geological forces, their methods of action, and finally the resulting geological structures. Prerequisites: Introductory Physics and Chemistry, either in high school or college.

2. HISTORICAL GEOLOGY

2nd Sem. 3 cr.

A study of the earth from the earliest geological periods to the present, emphasizing particularly the relations of land and sea, stratigraphic structure, and the appearance and development of plant and animal life. Prerequisites: Geology 1 and an introductory course in Biology, or in both Botany and Zoology.

GRAPHICS

(See Civil Engineering 1, 2, and 3)

GREEK LANGUAGE AND LITERATURE

Professor Scribner

1, 2. BEGINNER'S COURSE

1 & 2 Sem. 3 cr. ea.

Essentials of the grammar and syntax by oral and written work. Derivation of English words from the Greek. Prose selections.

3, 4. INTERMEDIATE COURSE

1 & 2 Sem. 3 cr. ea.

Xenophon's *Anabasis*, Homer's *Iliad*, Prose Composition. New Testament Greek: *The Gospel of Mark*. This course lays the foundation for the appreciation of Greek Literature.

5, 6. LYSIAS, HERODOTUS, HOMER

1 & 2 Sem. 3 cr. ea.

Selected speeches of Lysias and study of Greek oratory. Herodotus: Selections and readings from Plutarch. The Odyssey: Books I, V, IX, and sight reading. Study of the plot and Homeric life.

7. GREEK TRAGEDY

1st Sem. 3 cr.

Euripides: *Alcestis*. Sophocles: *Antigone*. Lectures on dramatic art and on the Greek theatre.

8. PLATO

2nd Sem. 3 cr.

The *Apology* and selections from other dialogues. Introduction to philosophy through the life and work of Socrates. (Greek 7 and 8 alternate with 5, 6).

- 9, 10. EVERYDAY GREEK 1 & 2 Sem. 1 cr. ea.

Helpful to students of science, literature and philosophy for an understanding of English words derived from Greek. Text: Hoffman's *Everyday Greek*.

- 19, 20. GREEK LITERATURE IN ENGLISH 1 & 2 Sem. 2 cr. ea.

English translations of Greek poets and prose writers. Study of English poems inspired by Greek literature.

- 45, 46. HISTORY OF GREECE 1 & 2 Sem. 2 cr. ea.

Greece and the Orient. Greek history to 31 B.C. The contribution of Greece to modern civilization. Lectures and study of sources. Not open to freshmen.

- 47, 48. HISTORY OF GREEK ART 1 & 2 Sem. 2 cr. ea.

The architecture, sculpture and minor arts of Greece. Lectures and work in the Carnegie Museum. A knowledge of Greek is not necessary.

- 109, 110. ADVANCED GREEK PROSE COMPOSITION 1 & 2 Sem. 1 cr. ea.
Syntax, idiom and continuous narrative.

- 131, 132. PLATO: THE REPUBLIC 1 & 2 Sem. 2 cr. ea.

The text, analysis of the argument and purpose of the work. Life and philosophy of Plato.

HISTORY

- 1, 2. MEDIAEVAL AND MODERN HISTORY 1 & 2 Sem. 3 cr. ea.

The period of European history from the fall of Rome to the present time. A prerequisite for all other courses in history in 1923-1924. Designed for freshmen. *Professor Cleven, Messrs. Dilworth and Hatfield.*

- 7, 8. INTRODUCTORY AMERICAN HISTORY (1492-1920) 1 & 2 Sem. 3 cr. ea.

A comprehensive survey of the whole period of American history. A prerequisite for more advanced courses in American history in 1923-1924. Designed for sophomores.

9. ECONOMIC HISTORY OF GREAT BRITAIN 1st Sem. 3 cr.

A study of the agriculture, industry and commerce of Great Britain from the earliest period to the present time. Designed for freshmen and sophomores who expect to enter the School of Economics.

10. ECONOMIC HISTORY OF THE UNITED STATES 2nd Sem. 3 cr.

Traces the growth of agriculture, industry, commerce, transportation, and labor from the isolated, agricultural communities of the Colonies to the complex, industrial and commercial society of today. Prerequisite: History 9.

11, 12. HISTORY OF ENGLAND

1 & 2 Sem. 3 cr. ea.

The period of English history from the Roman invasion to the present time. A prerequisite for more advanced courses in English history, including the course for prospective students of law, History 111, 112. Designed for sophomores. *Messrs. Dilworth and Hatfield.*

27, 28. CONTEMPORARY HISTORY AND CURRENT EVENTS

1 & 2 Sem. 1 cr. ea.

A weekly review of important current events with opportunity for discussion. Open to all undergraduates. *Professors James and Clevén; Messrs. Dilworth, Hatfield, etc.*

45, 46. HISTORY OF GREECE

1 & 2 Sem. 2 cr. ea.

(See Greek 45, 46).

(Not open to freshmen. Recommended for those who expect to teach secondary school history).

49, 50. ROMAN HISTORY

1 & 2 Sem. 2 cr. ea.

(See Latin 11, 12).

(Not open to freshmen. Recommended for those who expect to teach secondary school history).

71, 72. FRENCH HISTORY

1 & 2 Sem. 2 cr. ea

(Not given 1922-1923).

81, 82. LATIN AMERICA

1 & 2 Sem. 3 cr. ea.

An introductory course in Latin American history with emphasis the second semester upon commercial and political relations with the United States. A prerequisite for more advanced courses in Hispanic American history in 1923-1924. *Professor Clevén.*

Courses numbered over 100 not open to Freshmen and Sophomores).

105. THE RENAISSANCE

1st Sem. 3 cr.

(Given 1923-1924).

106. THE REFORMATION

2nd Sem. 3 cr.

(Given 1923-1924).

107, 108. THE BRITISH EMPIRE

1 & 2 Sem. 2 cr. ea.

The expansion of England and the rise and spread of British imperialism with a survey of the leading colonies. *Mr. Dilworth.*

111, 112. ENGLISH CONSTITUTIONAL HISTORY

1 & 2 Sem. 2 cr. ea.

The origin, growth and development of the English constitution. Especially recommended for students intending to study law. *Professor James.*

115. THE FRENCH REVOLUTION AND NAPOLEONIC PERIOD 1st Sem. 3 cr.

A comprehensive study of the dramatic period from 1789 to 1815.

118. EUROPE IN THE NINETEENTH CENTURY (1815-1878) 2nd Sem. 3 cr.

The Restoration period, the unification of Germany and Italy, the founding of the third French Republic, with emphasis upon social progress.

119, 120. RECENT EUROPEAN HISTORY 1 & 2 Sem. 3 cr. ea.

A thorough study of conditions and events leading to the great war and a sketch of subsequent events, particularly of reconstruction. *Professor Clevén.*

123, 124. MEDIAEVAL CIVILIZATION 1 & 2 Sem. 2 cr. ea.

(Given 1923-1924).

149, 150. HISTORY OF THE FAR EAST AND THE PACIFIC

1 & 2 Sem. 2 cr. ea.

A study of the economic, political and social conditions of China, Japan, Oceania and the Pacific coast countries from 1800. *Professor Clevén.*

151, 152. SOCIAL AND ECONOMIC HISTORY OF THE AMERICAN COLONIES

(1607-1763)

1 & 2 Sem. 2 cr. ea.

A detailed study of the social institutions and economic conditions of the colonial period of American history with emphasis upon Pennsylvania. *Professor James.*

153. THE AMERICAN REVOLUTION (1763-1789)

1st Sem. 2 cr.

The causes and significance of the Revolution, the steps leading to Independence, the progress of the war, peace negotiations, the confederation and the Constitution. *Professor James.*

154. THE MAKING OF THE NATION (1789-1815)

2nd Sem. 2 cr.

The Federalist and Republican regimes. The second war with England and the development of nationality. *Professor James.*

155. THE MIDDLE PERIOD (1815-1850)

1st Sem. 2 cr.

(Given 1923-1924).

156. THE CIVIL WAR AND RECONSTRUCTION

2nd Sem. 2 cr.

(Given 1923-1924).

157. AMERICAN FOREIGN POLICY

1st Sem. 2 cr.

(Given 1923-1924).

158. RECENT HISTORY OF THE UNITED STATES

2nd Sem. 2 cr.

(Given 1923-1924).

161, 162. THE TEACHING OF HISTORY

1 & 2 Sem. 2 cr. ea.

The field and importance of history, course organization, text book selection, methods of presentation, class work and special problems. *Professor James.*

163. HISTORY OF MEXICO.. 1st Sem. 3 cr.
A study of the economic, political and social conditions of the Mexican people from 1800 to the present time. *Professor Clevén.*

164. HISTORY OF ARGENTINA, BRAZIL AND CHILE 2nd Sem. 3 cr.
A study of the economic, political and social conditions of the peoples of Argentina, Brazil and Chile from 1800. *Professor Clevén.*

171, 172. THE EASTERN MEDITERRANEAN WORLD TO 1453
1 & 2 Sem. 2 cr. ea.
A survey of its civilization with emphasis upon the environment and rise of the great religions of the western world. *Mr. Hatfield.*

181, 182. PROSEMINAR IN MODERN EUROPEAN OR HISPANIC AMERICAN HISTORY 1 & 2 Sem. 2 cr. ea.
Introductory lectures on historic method and historiography followed by an investigation of a special topic in modern European or Hispanic American history. Open only to advanced students. (Alternates with 195, 196).

195, 196. PROSEMINAR IN AMERICAN HISTORY 1 & 2 Sem. 2 cr. ea.
(Given 1923-1924).

HISTORY OF RELIGION

Professor Linhart

1. HISTORY OF THE HEBREWS 1st Sem. 2 cr.
From the call of Abraham to the close of the Old Testament Canon.

2. HISTORY OF CHRISTIANITY 2nd Sem. 2 cr.
A historical study of the life of Jesus and of the founding and progress of Christianity in the Apostolic Age.

3. HISTORY OF RELIGION 1st Sem. 2 cr.
A study of the development of the religious consciousness of the race and of the leading features of the great historic religions.

4. INTRODUCTION TO THE ENGLISH BIBLE 2nd Sem. 2 cr.
A study of the origin, structure and literary history of the Bible.

ITALIAN

(See Modern Languages)

LATIN LANGUAGE AND LITERATURE

A major in Latin consists of courses 5, 6 and 7, 8; reading courses from among those numbered above 100 throughout the junior and senior years; and an additional course or courses from among those offered, of a value of at least four credits.

Students desiring a recommendation to teach Latin will be expected to take, in addition to the reading courses prescribed above, at least one course in Latin Composition, Latin 71, 72 or 171, 172 and the course in The Teaching of Secondary School Latin, 173, 174.

5, 6. CICERO, OVID AND LATIN COMEDY 1 & 2 Sem. 3 cr. ea.

Cicero, *de senectute* or *de amicitia*; Ovid, selections; Terence, *Phormio* or *Andria* or Plautus, *Mostellaria*. Prerequisite: three years of high school Latin. *Professor Sage; Mr. Gilmer.*

7, 8. PLINY AND HORACE 1 & 2 Sem. 3 cr. ea.

Pliny, Letters; Horace, Odes and Epodes. The texts as literature; manners and customs; scansion. Prerequisite: Latin 5-6. *Mr. Gilmer.*

11, 12. HISTORY OF ROME 1 & 2 Sem. 2 cr. ea.

The outlines of the subject, with particular reference to economic development. No knowledge of Latin required. Open to sophomores, juniors, and seniors. *Mr. Gilmer.*

51, 52. LAW LATIN 1 & 2 Sem. 2 cr. ea.

(Not given 1922-23).

71, 72. LATIN COMPOSITION 1 & 2 Sem. 1 cr. ea.

Study of grammar and vocabulary. Translation into Latin. To be taken in connection with Latin 5, 6 or 7, 8. Prerequisite: three years of high school Latin. *Mr. Gilmer.*

75, 76. RAPID READING OF CAESAR AND CICERO 1 & 2 Sem. 1 cr. ea.

Rapid reading of Caesar's *Galic War* and of a number of Cicero's Orations. Designed particularly as a review for students expecting to teach. Should be taken in conjunction with 173, 174. *Mr. Gilmer.*

85, 86. THE LATIN ELEMENT IN ENGLISH 1 & 2 Sem. 1 cr. ea.

(Not given 1922-23).

NOTE: Unless otherwise indicated, Latin 7-8 is prerequisite for the following courses.

101. HORACE, SATIRES 1st Sem. 2 cr.

Mr. Gilmer.

102. PLAUTUS 2nd Sem. 2 cr.

Three or four plays; scansion of the simpler meters; influence of Plautus on later literature. *Mr. Gilmer.*

155, 156. ROMAN CIVILIZATION

I & 2 Sem. 1 cr. ea.

For students not majoring in Latin but who desire a survey of the Roman elements in modern civilization and of Roman contributions in law, politics, architecture, literature, etc. No knowledge of Latin required, but students who do not have such knowledge will obtain the consent of the instructor before registering. *Professor Sage.*

157, 158. MYTHOLOGY

I & 2 Sem. 1 cr. ea.

Classical mythology with particular reference to the use of the myths made by ancient and modern writers and in ancient and modern art. Consent of instructor required. *Mr. Gilmer.*

161, 162. COMPARATIVE GRAMMAR

I & 2 Sem. 2 cr. ea.

The principles of comparative grammar, illustrated chiefly from Greek and Latin. *Mr. Gilmer.*

171, 172. ADVANCED LATIN COMPOSITION

I & 2 Sem. 1 cr. ea.

Written and oral translation into Latin. Review of constructions. This course may be elected repeatedly. To be taken in connection with a reading course or Latin 173, 174. Consent of instructor required. *Mr. Gilmer.*

173, 174. THE TEACHING OF SECONDARY SCHOOL LATIN

I & 2 Sem. 2 cr. ea.

Intelligent and attractive selection and presentation of material; consideration of points to be emphasized; the place and function of Latin in the high school curriculum; measurement of results. *Professor Sage.*

199, 200. SPECIAL WORK

I & 2 Sem. variable cr.

Under these numbers properly qualified students may register for individual work under the guidance of an instructor, whose consent must be obtained before registration.

MATHEMATICS

A. ALGEBRA

1st Sem. 3 cr., repeated 2nd Sem.

Elements of algebra through quadratics. Not counted on a major in mathematics. Prerequisite: Ninth grade mathematics.

C-D. PLANE GEOMETRY

I & 2 Sem. 3 cr. ea.

1. COLLEGE ALGEBRA

1st Sem. 3 cr., repeated 2nd Sem.

Standard traditional course. Prerequisite: Third semester algebra.

2. PLANE TRIGONOMETRY

1st Sem. 3 cr., repeated 2nd Sem.

The usual topics in this subject. Prerequisite: Third semester algebra.

3. SELECTED TOPICS IN MATHEMATICS 1 & 2 Sem. 3 cr. ea.

Primarily for students of economics and social science and those contemplating business careers. Prerequisite: Ninth grade mathematics.

4. SPHERICAL TRIGONOMETRY 2nd Sem. 3 cr.

Given when there is sufficient demand. Prerequisite: Mathematics 2.

5. SOLID GEOMETRY 1st Sem. 2 cr.

The usual course in the subject.

11, 12. ANALYTIC GEOMETRY 1 & 2 Sem. 2 cr. ea.

Introduction to use of Cartesian and polar co-ordinates in the solution of problems of plane and solid geometry, conics, higher curves. Prerequisite: Mathematics 1 and 2 or equivalent.

13, 14. CALCULUS 1 & 2 Sem. 3 cr. ea.

The customary hundred hour course in differential and integral calculus. Required of all students majoring in mathematics. Prerequisite: Mathematics 11-12.

17, 18. MATHEMATICAL THEORY OF INVESTMENT 1 & 2 Sem. 2 cr. ea.

Interest, annuities, sinking funds, loans and other topics. Designed for those who contemplate business careers. Prerequisite: One year of College Mathematics.

21, 22. ELEMENTARY ANALYSIS 1 & 2 Sem. 4 cr. ea.

Primarily for students of freshman group IV, covering, algebra, trigonometry and analytics. Prerequisite: Third semester algebra.

23, 24. CALCULUS 1 & 2 Sem. 4 cr. ea.

Primarily for students of the physical sciences and mining engineering. Prerequisite: Mathematics 21-22.

63, 64. CALCULUS 1 & 2 Sem. 3 cr. ea.

Briefer course, primarily for students entering the School of Engineering. Prerequisite: Mathematics 21-22.

101. DIFFERENTIAL EQUATIONS 1st Sem. 3 cr.

Introductory working course in ordinary equations with problems. Prerequisite: Integral calculus.

103. CALCULUS, Second Course 1st Sem. 3 cr.

105. THEORY OF EQUATIONS 1st Sem. 3 cr.

108. THEORETICAL MECHANICS 2nd Sem. 4 cr.

109, 110. THEORY AND METHODS OF TEACHING SECONDARY MATHEMATICS

1 & 2 Sem. 1 cr. ea.

Psychological basis, educational values; methods of presentation; curriculum. Prerequisite: One year of college mathematics and a certain maturity.

111. MODERN SYNTHETIC GEOMETRY	1st Sem. 3 cr.
114. SOLID ANALYTIC GEOMETRY	2nd Sem. 3 cr.
115. THEORY OF ERRORS AND LEAST SQUARES	1st Sem. 3 cr.
117. HISTORY OF ELEMENTARY MATHEMATICS	1st Sem. 3 cr.
118. HISTORY OF HIGHER MATHEMATICS	2nd Sem. 3 cr.
120. SYNTHETIC PROJECTIVE GEOMETRY	2nd Sem. 3 cr.
Fundamental projective forms, duality, conics, problems. Prerequisite: Plane and solid geometry and one year of college mathematics and a certain maturity.	
121. VECTOR ANALYSIS	1st Sem. 3 cr.
132. SYNOPTIC COURSE IN MATHEMATICS	2nd Sem. 3 cr.

MODERN LANGUAGES

Professors Raschen and Shelton; Assistant Professors Fairfield, Henry, and Johnson; Mr. Alpern, Miss Kelly, Mr. Ladd, Mrs. Lohstoeter, Mr. McCurdy, Miss Young.

GERMAN

1, 2. ELEMENTS OF GERMAN 1 & 2 Sem. 3 cr. ea.

The formal study of grammar, reading of narrative prose, systematic acquisition of a vocabulary, composition, and inductive study of grammatical forms.

3, 4. INTERMEDIATE GERMAN 1 & 2 Sem. 3 cr. ea.

This course in second year German is also a unit. Grammatical principles are reviewed, modern narrative and descriptive prose will be read and made the basis of conversation. Composition.

M 3, 4. MEDICAL GERMAN 1 & 2 Sem. 3 cr. ea.

A course in second year German, designed for students preparing for medicine. Reading of medical texts and literature.

Ch. 3, 4. CHEMICAL GERMAN 1 & 2 Sem. 3 cr. ea.

Chiefly for students in Chemistry. Reading of texts on Chemistry and allied sciences.

Ch. 5, 6. CHEMICAL GERMAN 1 & 2 Sem. 2 cr. ea.

Chemical and scientific papers and periodicals will be used in the second half of course. For juniors in Chemistry.

- 5, 6. MODERN GERMAN AUTHORS 1 & 2 Sem. 3 cr. ea.
 Rapid reading of texts of standard modern authors. Retroversion of text, discussion in German, collateral reading. Reports. Prerequisite: German 3-4.
- 7, 8. COMPOSITION AND COLLOQUIAL PRACTICE 1 & 2 Sem. 2 cr. ea.
 A course in advanced composition based on standard texts. Conversational practice. Prerequisite: German 5-6.
- 9, 10. SURVEY OF GERMAN LITERATURE 1 & 2 Sem. 2 cr. ea.
 An introduction to the field of German Literature. Assigned readings, lectures, reports. Prerequisite: German 3-4.
- 11, 12. SPRACH-UND STILUEBUNGEN 1 & 2 Sem. 2 cr. ea.
 A course in diction and expression. Conducted in German. Required of all who intend to teach German. Prerequisite: German 7-8.

GENERAL COURSES FOR STUDENTS MAJORING IN MODERN LANGUAGES

- 101, 102. PRINCIPLES OF PHONETICS 1 & 2 Sem. 1 cr. ea.
 A study of speech sounds, their formation and classification. Primarily for teachers of modern foreign languages. *Professor Raschen.*
- 105, 106. INTRODUCTION TO THE SCIENCE OF LANGUAGE 1 & 2 Sem. 2 cr. ea.
 A study of the facts of language; the changes in language, forms and distribution of language. Lectures, assigned readings, reports. *Professor Raschen.*
- 155, 156. THE TEACHING OF MODERN LANGUAGES 1 & 2 Sem. 1 cr. ea.
 Lectures, reports, and discussions of the various methods of teaching modern languages. Courses of study, textbooks, and supplementary materials are considered. *Professor Raschen.*
- 201, 202. PRINCIPLES OF LITERARY CRITICISM 1 & 2 Sem. 2 cr. ea.
 See English 201, 202.

SPECIFIC COURSES FOR MAJOR STUDENTS.

- 111, 112. GOETHE AND SCHILLER 1 & 2 Sem. 2 cr. ea.
- 113, 114. GOETHE'S 'FAUST' 1 & 2 Sem. 3 cr. ea.
Professor Raschen.
- 115, 116. LESSING AND HERDER 1 & 2 Sem. 2 cr. ea.

117, 118. GRILLPARZER AND KLEIST (Alternates with 115, 116.)	1 & 2 Sem. 2 cr. ea.
119, 120. GESCHICHTE DES DRAMAS	1 & 2 Sem. 2 cr. ea.
121, 122. GESCHICHTE DES ROMANS (Alternates with 119, 120.)	1 & 2 Sem. 2 cr ea

FRENCH

1, 2. ELEMENTARY FRENCH	1 & 2 Sem. 3 cr. ea.
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For beginners; grammar, easy composition and translation; dictation and conversation, with special stress on pronunciation. (French 1 and 2 both given in each semester. Students entering with one unit from high school should normally take French 2.)

3, 4. INTERMEDIATE FRENCH	1 & 2 Sem. 3 cr. ea.
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Translation and reading of modern prose, review of grammar, conversation, dictation. Prerequisite: French 1-2, or two units of high school French.

C 3, 4. COMMERCIAL FRENCH	1 & 2 Sem. 3 cr. ea.
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Parallel with French 3-4. Business forms and commercial correspondence; articles on commercial subjects.

5, 6. ADVANCED FRENCH	1 & 2 Sem. 3 cr. ea.
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Introduction to French Literature. Selections from the best authors, outside reading, lectures and discussions. Conducted mainly in French.

7, 8. SPEAKING AND WRITING FRENCH	1 & 2 Sem. 2 cr. ea.
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A more intensive study of the French idiom and irregular verb. Composition and conversation. Prerequisite: French 1-2, or two units of high school French

9, 10. SURVEY OF FRENCH LITERATURE	1 & 2 Sem. 2 cr. ea.
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An introduction to the field of French literature. Assigned readings, lectures, reports. Prerequisite: French 3-4.

11, 12. EXERCICES ORAUX ET COURS DE STYLE	1 & 2 Sem. 2 cr. ea.
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A course in expression and style. Conducted in French. Required of all who intend to teach French. Prerequisite: French 7-8.

SPECIFIC COURSES FOR MAJOR STUDENTS

111, 112. MODERN FRENCH LITERATURE	1 & 2 Sem. 3 cr. ea
113, 114. CLASSICISM AND ROMANTICISM	1 & 2 Sem. 2 cr. ea.
115, 116. 17TH AND 18TH CENTURY LITERATURE (Alternates with French 113-114.)	1 & 2 Sem. 2 cr. ea.

117, 118. THE DRAMA FROM CORNEILLE TO THE 19TH CENTURY

1 & 2 Sem. 2 cr. ea.

119, 120. THE NOVEL, IN THE 17TH, 18TH CENTURIES AND IN THE ROMANTIC PERIOD AND AFTER 1850.

1 & 2 Sem. 2 cr. ea

(Alternates with French 117-118.)

SPANISH

1, 2. ELEMENTARY SPANISH

1 & 2 Sem. 3 cr. ea.

Grammar, easy composition and translation. Dictation and conversation; special stress on pronunciation. (Spanish 1 and 2 are both given in each semester. Students entering with one unit from high school should normally take Spanish 2.)

3, 4. INTERMEDIATE SPANISH

1 & 2 Sem. 3 cr. ea.

Grammatical review, reading and translation of modern prose, conversation and pronunciation. Prerequisite: Spanish 1-2, or two units of high school Spanish.

C 3, 4. COMMERCIAL SPANISH

1 & 2 Sem. 3 cr. ea

Reading of texts or articles dealing with business practice. Composition and conversation, using a vocabulary of practical commercial value. Prerequisite: Spanish 1-2.

5, 6. ADVANCED SPANISH

1 & 2 Sem. 3 cr. ea.

Readings from the most important authors; lectures and reports. Conducted largely in Spanish. Prerequisite: Spanish 3-4.

7, 8. COMPOSITION AND CONVERSATION

1 & 2 Sem. 2 cr. ea.

A more advanced study of the use of the Spanish idiom and the irregular verb. Composition and constant practice in speaking. Prerequisite: Spanish 1-2.

9, 10. SURVEY OF SPANISH LITERATURE

1 & 2 Sem. 2 cr. ea.

An introduction to Spanish Literature. Assigned readings, lectures, reports. Prerequisite: Spanish 3-4.

ITALIAN

1, 2. ELEMENTARY ITALIAN

1 & 2 Sem. 3 cr. ea.

Grammar, composition and conversation with constant drill in pronunciation. Translation of modern prose.

3, 4. INTERMEDIATE ITALIAN

1 & 2 Sem. 3 cr. ea.

An introduction to Italian literature. Reading and translation from the best Italian authors. Conversation. Prerequisite: Italian 1-2.

MUSIC

Credits in Music, not to exceed 24, for certain courses taken in the Pittsburgh Musical Institute may be counted toward a degree in the College.

PALEONTOLOGY

Professor Ortmann

101. GENERAL PALEONTOLOGY (Invertebrates)

1st Sem. 2 cr., repeated 2nd Sem.

The course presents a general survey of the field of Invertebrate Paleontology, giving special attention to those groups of which the field-geologist is required to possess a good working knowledge. The course may be taken by the student either in first or in the second semester, but only students with some training in Geology and Zoology will be admitted. Prerequisite: Geology 1-2; Zoology 1-2.

PHILOSOPHY

1. INTRODUCTION TO PHILOSOPHY

1st Sem. 3 cr.

This course has two objectives: (1) To serve as an introduction to further study in Philosophy, and (2) To meet the needs of the general student who wishes to find for himself a method and point of view for considering the meaning of the world and of human life. Open to sophomores. *Professor Linhart.*

2. ELEMENTARY ETHICS

2 Sem. 3 cr.

The beginnings and growth of morality; the problems which present themselves as ethical problems to present day men and women; the quality of the ethical situation and the meaning of the moral; fundamental questions of ethical theory raised by current situations, and discussion of them in the light of the history of ethical theory. Open to sophomores. *Professor Linhart.*

3. LOGIC

1st Sem. 3 cr.

An introductory course in which the subject is presented from the point of view of the general method of thinking and of scientific procedure. (Not given in 1922-1923). *Professor Linhart.*

4. HISTORY OF ETHICS

2nd Sem. 3 cr.

A study of the historical development of ethical principles, both ancient and modern, with critical estimates of current ethical theories. Open to sophomores. (Not given in 1922-1923). *Professor Linhart.*

7, 8. GENERAL HISTORY OF PHILOSOPHY

1 & 2 Sem. 3 cr. ea.

In this course there is given a general view of the historic development of Philosophy in Western Civilization, from its beginnings among the Greeks until the present day. Emphasis will be put upon the original sources. The great systems of thought will always be considered in relation to their setting, and with a view to the contribution made by each. Not open to freshmen. *Professor Gabbert.*

103, 104. POLITICAL PHILOSOPHY

1 & 2 Sem. 2 cr. ea.

A study of political philosophers from Plato to Bentham and Mill, considering their work as critics of political institutions in their own times, and as leaders in the evolution of political thought. *Dr. Lyans.*

106. SOCIAL ETHICS

2nd Sem. 3 cr.

A course whose purpose is to show the social origin and meaning of ethical ideas, and to make the student acquainted with the historic development of social theory. *Professor Gabbert.*

109. THE IDEA OF PROGRESS

1st Sem. 2 cr.

Study of the philosophical theories of progress, with special emphasis on the function of the idea. (Not given in 1922-1923).

110. NATURALISM AND SUPERNATURALISM

2nd Sem. 2 cr.

These two contrasting methods of interpreting events will be viewed in their development, and will be evaluated in the light of their history. (Not given in 1922-23).

113. CONTEMPORARY PHILOSOPHY IN AMERICA

1st Sem. 2 cr.

The philosophic situation and tradition in America at the close of last century; the rise of new movements: Pragmatism, New Realism, Critical Realism. Emphasis will be placed on the position of these schools of thought with respect to the creative activity of the conscious individual. *Professor Gabbert.*

114. PHILOSOPHY OF RELIGION

2nd Sem. 2 cr.

Religion will be studied in the light of the problems and methods of contemporary thought. *Professor Gabbert.*

201, 202. PHILOSOPHY SEMINAR

1 & 2 Sem., variable cr.

A special guidance of advanced students in the study of particular problems in philosophy. *Professor Gabbert.*

PHYSICS

1, 2. GENERAL COLLEGE PHYSICS

1 & 2 Sem. 4 cr. ea.

The fundamental principles of the science, its historical development, relation to the other sciences and practical applications. High school

physics is not a prerequisite but is recommended. Primarily for freshmen. Four hours lecture and recitation; three or four hours laboratory.

3, 4. ELEMENTARY MECHANICS 1 & 2 Sem. 2 cr. ea.

Problems in the mechanics of solids, liquids and gases selected for their application in engineering and for their value in developing skill in practical mathematical manipulation. Prerequisite: Physics 1-2. Recitations two hours. *Professor Becknell.*

5. LABORATORY MECHANICS AND HEAT 1st Sem. 2 cr.

Special course given by the laboratory method for engineering students. Taken in conjunction with 3 or 4. Laboratory six hours. *Professor Coulson.*

6. LABORATORY ELECTRICITY 2nd Sem. 2 cr.

Similar to Physics 5. Taken in conjunction with 3 or 4. Six hours. *Professor Coulson.*

9, 10. ADVANCED GENERAL PHYSICS 1 & 2 Sem. 5 cr. ea.

A second general course based on a previous year's work in college physics. Part 9 covers mechanics and heat; and 10 covers sound, light, and electricity. Required of students majoring in Physics and in Chemistry. Prerequisite: Physics 1-2 or equivalent. Three recitations and four laboratory hours.

S 17, 18. GENERAL ADVANCED LABORATORY Summer Session variable cr.

Special course in selected parts of Physics 9-10 of the regular session. Primarily to supplement previous training in preparation for graduate work. Prerequisite: One year of College Physics.

40, 41, 42. ELECTRICAL MEASUREMENTS 1, 2, & 3 Terms, 2 cr. ea.

A course in electrical measurements covering both the theory and the practical applications of the more useful instruments, fundamental to electrical work. Special attention is given to the physical principles underlying the more refined measurements in electrical engineering. Required of electrical engineering students. Prerequisite: Calculus and Sophomore Physics.

103, 104. INTRODUCTORY MATHEMATICAL PHYSICS 1 & 2 Sem. 3 cr. ea.

Selected problems illustrated with numerical examples and chosen to train the students in the application of the mathematics to Physics and allied subjects. Recommended for all students interested in Physics, Mathematics, Astronomy or Chemistry. Prerequisite: Calculus and Physics 9-10 or their equivalent. *Professor Becknell.*

105, 106. PHYSICS IN THE INDUSTRIES. 1 & 2 Sem. 2 cr. ea.

This course, given by the Dean of the School of Engineering, deals with the application of the principles of Physics as such to industries. The choice of subject matter is made with special reference to the appli-

cation of Physics to industrial research. The many local industries furnish an excellent basis for such a course. Prerequisite: Calculus and Physics 9-10 or their equivalents. Lectures and recitations two hours a week. *Professor Bishop.*

113, 114. MECHANICS AND WAVE MOTION 1 & 2 Sem. 2 cr. ea

An introductory course in the fundamentals of mechanics as needed in the study of Physics, Chemistry, and Engineering. The latter part of the course deals with wave motion in material media. Prerequisite: Calculus and Physics 9-10 or their equivalent. Lectures and recitations, two hours. *Professor Clo.*

117, 118. ADVANCED LABORATORY 1 & 2 Sem. variable cr.

Special laboratory problems selected to train the student in the methods of research. Given only on sufficient demand. Prerequisite: Calculus and Physics 9-10 or their equivalents. *Professor Clo and members of the Staff.*

121, 122. THERMODYNAMICS 1 & 2 Sem. 2 cr. ea.

A course based on Planck's Theory, but more condensed than his. Prerequisite: Calculus and Physics 9-10 or their equivalents. Lectures and recitations two hours a week. *Professor Becknell.*

141, 142. PRACTICE AND THEORY OF ELECTRIC AND MAGNETIC INSTRUMENTS 1 & 2 Sem. 3 cr. ea.

Primarily for students of Physics, Chemistry, Astronomy, Mathematics and allied sciences. Prerequisite: Physics 9-10 and Calculus or their equivalents. One hour conference and 6 hours laboratory. *Professor Coulson.*

143, 144. ELECTRICITY AND MAGNETISM 1 & 2 Sem. 2 cr. ea.

General theory coordinate with Physics 141, 142, but not necessarily accompanying it. Prerequisite: Physics 9-10 and Calculus or their equivalents. Two hours a week. *Professor Clo.*

145, 146. MODERN ELECTRICAL THEORY 1 & 2 Sem. 2 cr. ea.

General electron theory, physical properties of electrons and ions, radioactivity. Prerequisite: Physics 9-10 and Calculus or their equivalents. Two hours a week. *Professor Clo.*

153, 154. PHYSICAL OPTICS 1 & 2 Sem. 2 cr. ea.

Dispersion, interference, diffraction, double refraction, polarization, magneto-optics, and spectroscopy. Prerequisite: Physics 9-10 and Calculus or their equivalents. Two hours a week. *Professor Blackwood.*

155, 156. OPTICAL MEASUREMENTS

1 & 2 Sem. 2 cr. ea.

Laboratory course coordinate with Physics 153, 154 but not necessarily accompanying it. Experiments with spectrometer, interferometer, Fresnell mirrors, polarimeters and spectrophotometer. Prerequisite: Physics 9-10 and Calculus or their equivalents. One hour conference and three hours laboratory.

POLITICAL SCIENCE

1, 2. MODERN NATIONAL GOVERNMENT

1 & 2 Sem. 3 cr. ea.

A survey of the theory and practice of government with special emphasis upon the government of the United States. *Professor Manley and Instructor.*

3. GOVERNMENT OF AMERICAN STATES

1st Sem. 2 cr.

Original principles; electorate; political parties; elections; state executive; legislative and judicial departments; constitutional conventions; direct legislation; plans of reform. *Mr. Schramm.*

4. MUNICIPAL GOVERNMENT

2nd Sem. 2 cr.

City and State; powers and responsibilities of cities: electorate; municipal politics; mayor-council, commission and city manager plans; municipal reforms. *Mr. Schramm.*

6. COMPARATIVE GOVERNMENT

2nd Sem. 2 cr.

A comparative study of the leading governments of the world and of their mutual relations. *Professor Manley.*

7e, 8e. AMERICAN CONSTITUTIONAL HISTORY

1 & 2 Sem. 2 cr. ea.

The English Constitution; a general and introductory course to American institutions and government. *Professor Thorpe.*

13, 14. AMERICAN CONSTITUTIONAL LAW

1 & 2 Sem. 2 cr. ea.

The essentials of American Constitutional Law. Prerequisite. Political Science 1-2 and 7e-8e. Open to juniors and seniors. *Professor Thorpe.*

17. POLITICAL PARTIES

1st Sem. 2 cr.

Political parties in the United States, their history, organization, development, principles and methods; functions of political parties in American government. *Professor Manley.*

18. AMERICAN DIPLOMACY

2nd Sem. 2 cr.

Prerequisite: Political Science 1-2 and 7e-8e. Open to juniors and seniors. *Professor Thorpe.*

21. INTERNATIONAL LAW

1st Sem. 2 cr.

Prerequisite: Political Science 1-2 and 7e-8e. Open to juniors and seniors. *Professor Thorpe.*

23. PRINCIPLES OF JURISPRUDENCE

1st Sem. 2 cr.

Prerequisite: Political Science 1-2 and 7e-8e. Open to juniors and seniors. *Professor Thorpe.*

26. ADMINISTRATIVE LAW

2nd Sem. 2 cr.

Separation of governmental powers and delegation of legislative power; federal and state administrative organizations; powers of administrative officers, methods of enforcing governmental commands; remedies of the individual against unlawful action of public officers. *Professor Thorpe.*

PSYCHOLOGY

1. HOW TO STUDY

1st Sem. 1 cr.

Principles of effective study, correct study habits, methods of attacking new tasks; the purpose being to make study easier, more pleasant, and more productive. Open to freshmen.

3, 4. GENERAL PSYCHOLOGY (Introduction)

1 & 2 Sem. 3 cr. ea.

A study of the essentials of psychology. Lectures, discussion, demonstrations, and experiments. Open to sophomores. *Professor Snyder, Dr. Rich, Miss Bartlett.*

E 5. GENERAL PSYCHOLOGY FOR ENGINEERING STUDENTS

Fall & Winter Terms, 3 cr.

An abbreviation of Psychology 3, 4 with emphasis on selected problems. *Dr. Rich.*

6. INTRODUCTORY PSYCHOLOGY

2nd Sem. 3 cr.

A one-semester course in the essentials of psychology, designed for sophomores preparing to enter the School of Engineering. *Dr. Rich.*

E 6. APPLIED PSYCHOLOGY FOR ENGINEERING STUDENTS

Spring & Summer Terms, 2 cr.

Applications of psychology in engineering work. Individual differences, group psychology, leadership, the psychology of handling men. Prerequisite: Psychology 5. *Dr. Rich.*

15, 16. PSYCHOLOGY APPLIED TO BUSINESS

1 & 2 Sem. 2 cr. ea.

(a) A study of the principles of psychology. (b) Applications of these psychological principles to business practice. *Professor White.*

(Given in the Evening School of Economics. See bulletin of that School.)

17, 18. ADVANCED BUSINESS PSYCHOLOGY

1 & 2 Sem. 2 cr. ea.

A study of the business executive, the necessary personal qualities,

and problems in selecting and managing men. *Professor White.*

(Given in the Evening School of Economics. See bulletin of that School.)

21. THE PSYCHOLOGY OF ADVERTISING AND SELLING 1st Sem. 2 cr.

Advertising and selling studied from the point of view of the accepted facts, laws and methods resulting from the experimental study of human nature. Prerequisite: Psychology 3-4. *Dr. Rich*

22. EMPLOYMENT PSYCHOLOGY 2nd Sem. 2 cr.

A careful analysis of the more important employment problems from the psychological point of view. Prerequisite: Psychology 3-4. *Dr. Rich.*

61. EDUCATIONAL PSYCHOLOGY (Introduction) 1st Sem. 3 cr.

A general course covering the applications of the principles of psychology to teaching, with emphasis on instincts, learning, and individual differences. Prerequisite: Psychology 3-4 or equivalent.

101. VOCATIONAL PSYCHOLOGY 1st Sem. 2 cr.

Methods of determining individual differences, vocational fitness. Self-analysis and self-measurement. Psychological aspects of the various professions and occupations. Prerequisite: Psychology 3-4 or equivalent. *Professor Snyder.*

107, 108. EXPERIMENTAL PSYCHOLOGY 1 & 2 Sem. 3 cr. ea.

Laboratory work and discussions familiarize the student with typical methods, apparatus, and results in the most important fields of experimental psychology. Prerequisite: Psychology 3-4 or equivalent. *Professor Snyder and Dr. Rich.*

109, 110. ADVANCED EXPERIMENTAL PSYCHOLOGY 1 & 2 Sem. variable cr.

Students are taught the methods of systematic procedure in psychological research and each student makes a detailed investigation of a problem. Prerequisite: Psychology 3-4 and 107-108 or their equivalents. *Professors White and Snyder and Dr. Rich.*

117. PHYSIOLOGICAL AND COMPARATIVE PSYCHOLOGY 1st Sem. 3 cr.

Growth, structure, and functions of the central nervous system and the sense organs. Dissection, laboratory experiments, and demonstrations. Mental development. Prerequisite: Psychology 3-4 or equivalent. *Professor Snyder.*

118. GENETIC PSYCHOLOGY 2nd Sem. 3 cr.

Child development with emphasis on heredity, instincts, motor, social, moral, and religious development and training. Nascent periods. Prerequisite: Psychology 3-4 or equivalent. *Professor Snyder.*

121, 122. SOCIAL PSYCHOLOGY 1 & 2 Sem. 3 cr. ea.

The individual and society, suggestion, fashion, custom, superstition, conventionality, communication, group psychology, conflict, public opinion,

leadership. Study of personal traits. Prerequisite: Psychology 3-4 or equivalent. *Professor White and Dr. Rich.*

131, 132. ABNORMAL PSYCHOLOGY 1 & 2 Sem. 3 cr. ea.

Study of sleep, dreams, fatigue, intoxications, hypnotism, multiple personality, abnormalities of the intellectual, emotional, and volitional processes; psychology of the insane, criminal, genius. Prerequisite: Psychology 3-4 or equivalent. *Professor White and Miss Bartlett.*

142. PSYCHOLOGY OF RELIGION 2nd Sem. 2 cr.

Genetic interpretation of religion in the light of modern psychology and philosophy. Survey of recent literature on psychology of religion. Prerequisite: Psychology 3-4 or equivalent; Psychology 121 is advised. *Professor White.*

151, 152. HISTORY OF PSYCHOLOGY 1 & 2 Sem. 2 cr. ea.

Analysis of the tendencies in the development of psychology. Growth of the fundamental psychological concepts and theories. Prerequisite Psychology 3-4 and an additional year in Psychology.

161, 162. CURRENT EDUCATIONAL PSYCHOLOGICAL LITERATURE 1 & 2 Sem. 2 cr. ea.

Reports and discussions of recent books, magazine articles, and reviews dealing with educational psychology, mental measurements, and clinical psychology. The nature of this course admits of repeated registration. Prerequisite: Psychology 3-4 and 61 or their equivalents. *Professor Root.*

163. SUBNORMAL AND SUPERIOR CHILDREN 1st Sem. 2 cr.

The subnormal and superior child will be treated in turn. There will be a critical consideration of the possible factors of heredity, and environment, and education involved in either case. Prerequisite: Psychology 3-4 and 61 or their equivalents. *Professor Root.*

165, 166. EDUCATIONAL PSYCHOLOGY 1 & 2 Sem. 2 cr. ea.

Problems of learning, fatigue, formal discipline, individual differences, and original endowment will be considered. Prerequisite: Psychology 3-4 and 61 or their equivalents. *Professor Root.*

167, 168. STATISTICAL METHOD 1 & 2 Sem. 2 cr. ea.

This course will deal with the theoretical and practical aspects of statistical method as applied to psychology. Students desiring to do thesis work in educational or clinical psychology should plan to take Psychology 167, 168 as early as possible. Prerequisite: Psychology 3-4 and 61 or their equivalents. *Professor Root.*

169, 170. PSYCHOLOGICAL TESTS 1 & 2 Sem. 2 cr. ea.

This course will consist in a detailed and critical analysis of various psychological tests. Prerequisite: Psychology 3-4 and 61 or their equivalents. *Professors Root and Teagarden.*

201, 202. PSYCHOLOGICAL RESEARCH

(For description, see Graduate School bulletin). *Members of the graduate staff.*

211, 212. PSYCHOLOGICAL SEMINAR

(For description, see Graduate School bulletin). *Members of the graduate staff.*

SPANISH

(See Modern Languages)

ZOOLOGY

(See Biological Sciences)

The following courses, offered in the School of Economics, may be counted in satisfying degree requirements in the School of Education:—

ACCOUNTING

71, 72. PRINCIPLES OF ACCOUNTING AND ACCOUNTING PRACTICE

1 & 2 Sem. 4 cr. ea.

This course considers the purpose and scope of accounting; the financial transaction and its relation to the various activities of a business enterprise; accounts as media for classifying transactions; factors of financial condition and operation; theory and method of account classification; significance and relation of the various accounts; the media for, and method of, recording financial transactions; the accounting system; collection; organization and presentation of financial data; financial statements; their classification, form, content, significance, interpretation and use as bases for administration. Laboratory work will parallel the discussion of the theory of accounting in the fundamental processes of accounting, such as accruals, closing entries, trial balances and the preparation of financial statements with the variations and peculiarities incident to sole proprietorship, co-partnership, corporations, consolidations, mergers, holding companies receivership and liquidations.

Assistant Professor Bennett.

73. INDUSTRIAL COSTS AND ACCOUNTING

1st Sem., 4 cr.

The design and installation of cost systems; benefits to be derived from accurate costs; purchase, use and storage of materials; the payroll and methods of securing labor costs; types of cost system for various industries plan of wage payment; efficiency work and scientific management; depreciation; the factory burden, its determination and apportionment, including a study of scientific machine rates; inspection of cost systems in use and the literature of cost accounting. *Professor Reitel.*

74. ADVANCED INDUSTRIAL ACCOUNTING

2nd Sem. 4 cr

Advanced study of factory accounting problems in plants open to personal observations. Practice in observation, analysis, originality and

judgment through the assignment of problems requiring for solution a practicable system of accounts and accounting method, with provision for adequate operating reports and statistics. *Professor Reitell.*

91, 92. ACCOUNTING PROBLEMS

1 & 2 Sem., 2 cr

This course has a two-fold purpose; first, to teach generalization and develop ability to reason from a statement of facts without the books of account; second, to permit an intensive study of many of the variations in topics in accounting practice. The problems covered constitute a series complex in content and construction and varied in application. Auditing with practical work in actual audits, and devising systems for actual installation form a large part of the course.

Professor Reitell and Assistant Professor Bennett

BUSINESS ORGANIZATION AND MANAGEMENT

71. BUSINESS ECONOMICS

1 Sem. 4 cr.

The application of economic principles to business affairs. Attention will be directed to problems of production and consumption rather than to those dealing with economic value and distribution. Among the topics treated are: fundamental concepts, property, government, contract, competition, association; development of machine industry; changes in the size of representative business units; speculative enterprise; increasing and diminishing returns applied to particular industries; elasticity of demand and of prices; industrial and commercial concentration; encroachments on private property; social and governmental control. *Professor Wright.*

72. BUSINESS ORGANIZATION AND CONTROL

2 Sem. 4 cr.

A survey of the principles and forms of organization as found in various branches of business, functions and interrelation of principles and subsidiary departments and the adaptation of different types of organization to particular industries. Consideration is given to the selection, qualifications and training of executives, methods of executive control and the operation of organization through various executive policies. *Professor Wright.*

73, 74. PUBLIC RELATIONS OF BUSINESS

1 & 2 Sem., 2 cr. ea.

Relation of government to business and industry. Development of regulation in the United States. Legal, constitutional and political principles involved. *Professor Wright.*

91, 92. BUSINESS POLICY

1 & 2 Sem., 2 cr. ea.

Analysis and solution of a series of typical business problems from the point of view of the business executive. *Professor Wright and members of the staff.*

BUSINESS LAW

71, 72. LAW OF BUSINESS AGREEMENTS

1 & 2 Sem., 4 cr. ea.

The object of this course is to familiarize the student with the principles of law underlying ordinary business transactions. It includes contracts, their formation, operation, interpretation and discharge; agency, formation of the contract of agency, rights and obligation of principals, agents and third parties, termination of the relation; bailments, including contracts for pledging, hiring, and transporting personal property; sales and mortgages of personal property; leases, mortgages and sales of real estate; suretyship and guaranty; fire and life insurance contracts. *Professor Reed, Mr. McCrady.*

73. LAW OF BUSINESS ORGANIZATIONS

1st Sem., 4 cr.

A more intensive study of the law of partnerships and corporations than would be possible in a general course in business law. It includes the formation of partnerships; the liability of the members of defectively incorporated associations; the test of a partnership; the powers, rights and liabilities of partners; the rights and remedies of creditors; dissolution of partnerships; the distribution of partnership assets; limited partnerships; corporations, their formation, nature, and management; corporate powers; mode of contracting; rights and liabilities of stockholders; duties and liabilities of promoters and officers; dissolution and winding up of a corporate business. *Professor Reed.*

74. LAW OF COMMERCIAL PAPER

2nd Sem., 4 cr.

An intensive study of the law of negotiable instruments based on the negotiable instruments law of Pennsylvania. It includes the essentials of negotiable paper; a study of the contracts of the maker, acceptor, certifier, drawer, indorser, vendor, accommodator, and assurer; the rights of a holder in due course; the defenses to commercial paper; the payment and discharge of negotiable contracts. *Professor Reed.*

COMMERCE

71. PRINCIPLES OF MARKETING

1 & 2 Sem., 4 cr. ea.

The principal marketing methods and the work of different middlemen, brokers, wholesalers, auctions, produce exchanges and various types of retailers. Co-operative marketing. Trade associations. Some of the fundamental marketing policies such as a stock turnover, price policies, marketing analysis, etc. *Professor Converse.*

72. ADVANCED MARKETING POLICIES

2 Sem., 4 cr.

A more advanced and comprehensive study of marketing policies than is included in the Principles of Marketing (Commerce 101) Considers such policies as market analysis, price determination, advertising and publicity, credit policies, merchandising policies, purchasing policies, service and guarantee policies, etc. Prerequisite Commerce 71. *Professor Converse.*

74. SALESMANSHIP AND SALESMANAGEMENT 2 Sem., 4 cr.

The principles and practice of personal salesmanship. The principles of salesmanagement such as methods of employing, training, paying, and supervising salesmen; location of branch houses; assigning of quotas; managing sales conventions and sales contests; dealer aids, coordination of the work of the sales department; the credit department, and the advertising department; management of sales campaigns; etc. Prerequisite Commerce 71. *Professor Converse.*

75, 76. PRINCIPLES OF ADVERTISING 1 & 2 Sem., 2 cr. ea.

Analysis of the elements and factors which control human action in buying and selling. Place and function of advertising, study of advertising, planning, research and analysis, preparation of copy, selection of media and placing of copy, relations of advertiser, agency, and publisher; social and economic aspects *Assistant Professor MacQueen.*

77, 78. PRINCIPLES OF INSURANCE 1 & 2 Sem., 2 cr. ea.

A statement of the underlying principles upon which all forms of insurance are based. Relation of insurance to other economic agencies, insurance, principles underlying the making of the contract or policy, different types of insurance. *Mr. Howard.*

FINANCE

71, 72. BANKING 1 & 2 Sem., 4 cr. ea.

The function and history of banking. The organization and administration of the various types of banking institutions. A study in detail of banking operations — loans and investments, deposits, clearing and collection, reserves, etc. The bond, trust, foreign, safe deposit, and other departments. A large part of the second semester will be devoted to the organization and operation of the Federal Reserve System. *Assistant Professor Jones.*

73, 74. CORPORATION FINANCE AND INVESTMENTS 1 & 2 Sem., 4 cr. ea.

This course outlines the problems of financing and reorganizing corporations, and also presents the principles which the investor should have in mind in purchasing corporate securities. *Professor Kidd.*

75, 76. BUSINESS FINANCE 1 & 2 Sem., 4 cr. ea.

A survey of the financial operations dealing with the establishment and maintenance of the average business enterprise. Among the topics to which attention will be given are: starting a business, methods of securing fixed and working capital; financing purchases; credits and collections; price policies; distribution of earnings; methods of handling enterprises in financial difficulty. *Assistant Professor MacQueen.*

77. THE STOCK MARKET 1 Sem., 2 cr.

A study of the organization and operation of the stock exchange, with particular reference to the New York Stock Exchange. The business of the stock broker and his relations with his customers. *Assistant Professor Jones.*

78. BANKING PROBLEMS

2 Sem., 2 cr.

An advanced course in banking dealing with particular problems selected for intensive study. One of such subjects during the current year will be the proposed Pennsylvania banking code. *Assistant Professor Jones.*

FOREIGN TRADE

71, 72. PRINCIPLES AND METHODS OF FOREIGN TRADE 1 & 2 Sem., 4 cr. ea.

Economic theory of international trade; significance of foreign trade, merchant marine, and port development; national policies affecting international commerce; export and import methods; export organization; governmental assistance.

Examination of the geographical principles, economic status and commercial prospects of the principal foreign countries of the world from the point of view of their resources, their demand for American products and the channels of trade. The principal countries are considered individually with reference to their commercial and industrial development, typical organization of industries, method of distribution, influence of transportation systems and organization of export trade. *Professor Kidd.*

INDUSTRIAL MANAGEMENT

71. INDUSTRIAL TECHNOLOGY

1 Sem., 4 cr.

A study of the history, location, manufacturing processes, competitive conditions and outstanding problems of the leading industries of the United States. Analysis of productive processes, and the influence of technological changes on the institutional framework of economic society. Problems of industrial technique, national resources and production for wide markets. *Professor Reitell.*

72. INDUSTRIAL ORGANIZATION AND MANAGEMENT

2 Sem., 4 cr.

A fundamental course in the principles of internal organization and management of industrial enterprise. It will include a discussion of the location of plants, layout and types of construction; materials, equipment, and power; planning and routing; statistics and accounting; scientific management; purchasing, traffic, credit and collection. *Professor Reitell.*

73. LABOR ORGANIZATION AND STANDARDS

1 Sem., 4 cr.

The purpose of this course is to study the position of labor as a factor in production and distribution in modern industrial society. The major portion of the work will be concentrated on an examination of the structural and functional aspects of American trade unions and on their social, political and economic significance; on the traditional means of settling labor disputes,—the strike, the boycott, and lockout, mediation, conciliation and arbitration; on the present day reliance upon "labor laws"; on the shop committee and on the impartial chairmanship machinery. This course

is prerequisite to the course in Personnel Administration. *Assistant Professor Gillman.*

74. PERSONNEL ADMINISTRATION

2 Sem., 2 cr.

The organization, management and functions of employment departments; selection, training and placement of the workman; job analysis and wage setting; health, safety and sanitation; housing and transportation; workmen's cooperative and welfare systems. Only students who have had Labor Standards will be admitted to this course. *Assistant Professor Gillman.*

STATISTICS

71. INTRODUCTION TO STATISTICAL METHOD

1 Sem., 4 cr.

In this course a study is made of the elementary principles of statistical investigation, presentation and interpretation. Prime consideration is given to an understanding of statistical units, the preparation and editing of schedules, the various types of average, and index numbers, and of the application of the theories of dispersion and correlation. *Assistant Professor Gillman.*

73, 74. BUSINESS STATISTICS

1 & 2 Sem., 2 cr. ea

In this course an effort is made to master the technique of statistical investigations underlying modern business research. The student will study population growths, migrations and the labor supply; the use of statistics in salesmanship and advertising; production statistics and the work of the "statistical office." *Assistant Professor Gillman.*

76. THE BUSINESS CYCLE

2 Sem., 4 cr.

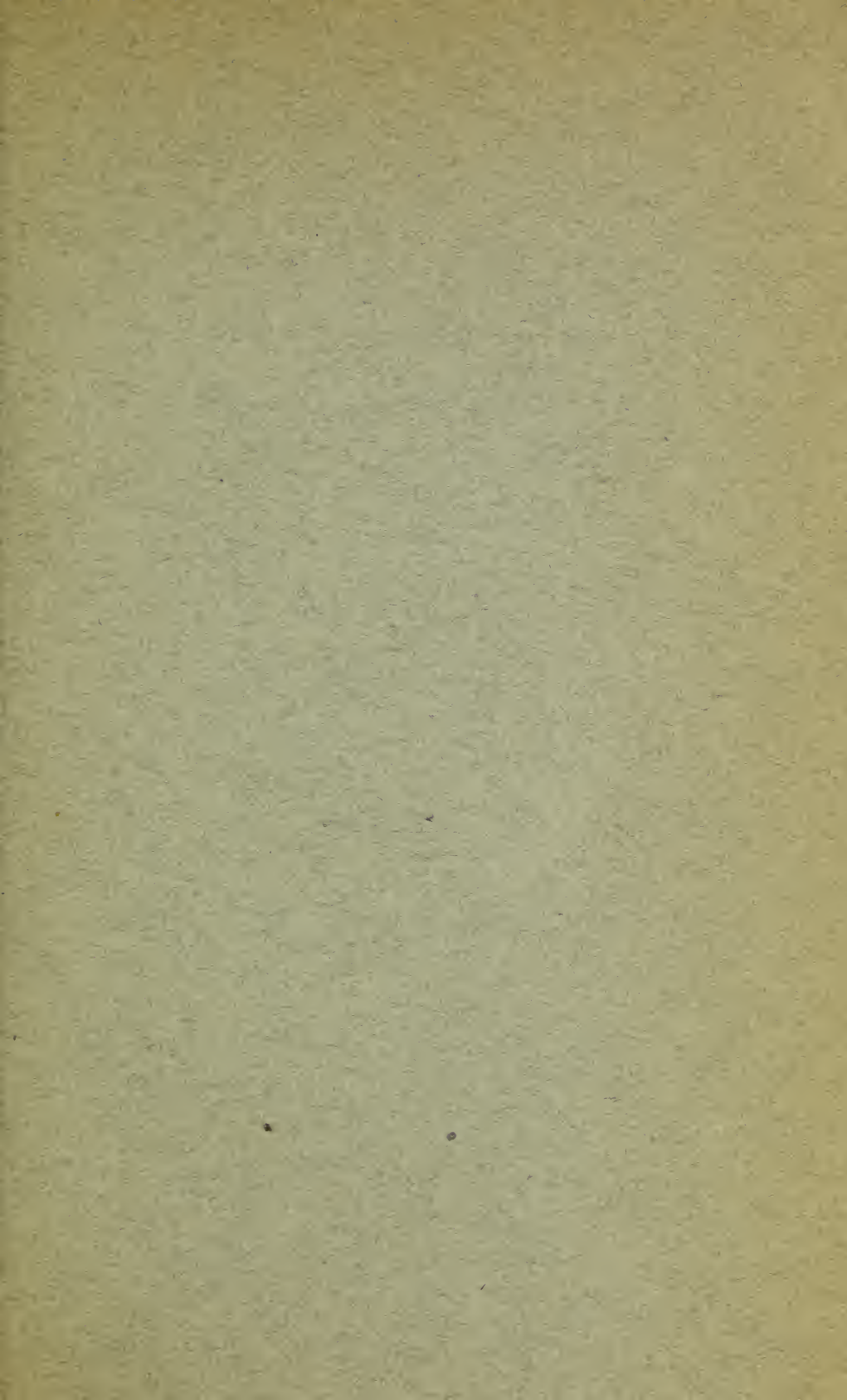
In this course the student will learn to measure and analyze the factors that interact in the formation of business trends, and in the forecasting of the business cycle. The course will be patterned on the work of W. C. Mitchell, H. L. Moore, W. M. Person and others. This course is open only to students of the second semester of the senior year. *Assistant Professor Gillman.*

TRANSPORTATION

71. RAILROAD TRANSPORTATION

1 Sem., 4 cr

History of transportation in the United States. The rise of motor truck and air transportation. Organization and management of the railroads. The freight, passenger, express, and mail services. Rate structures and the principles of rate making. Relation of the railroads to shippers. Public utility valuation. The regulation of the railroads by federal and state governments. The question of government ownership. The relation of the railroads to the inland water carriers. *Professor Converse.*





UNIVERSITY OF PITTSBURGH
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